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Revamps Sales Strategy p. 42
Fast Multi-Unit Packaging p. 53

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FOOD ENGINEERING

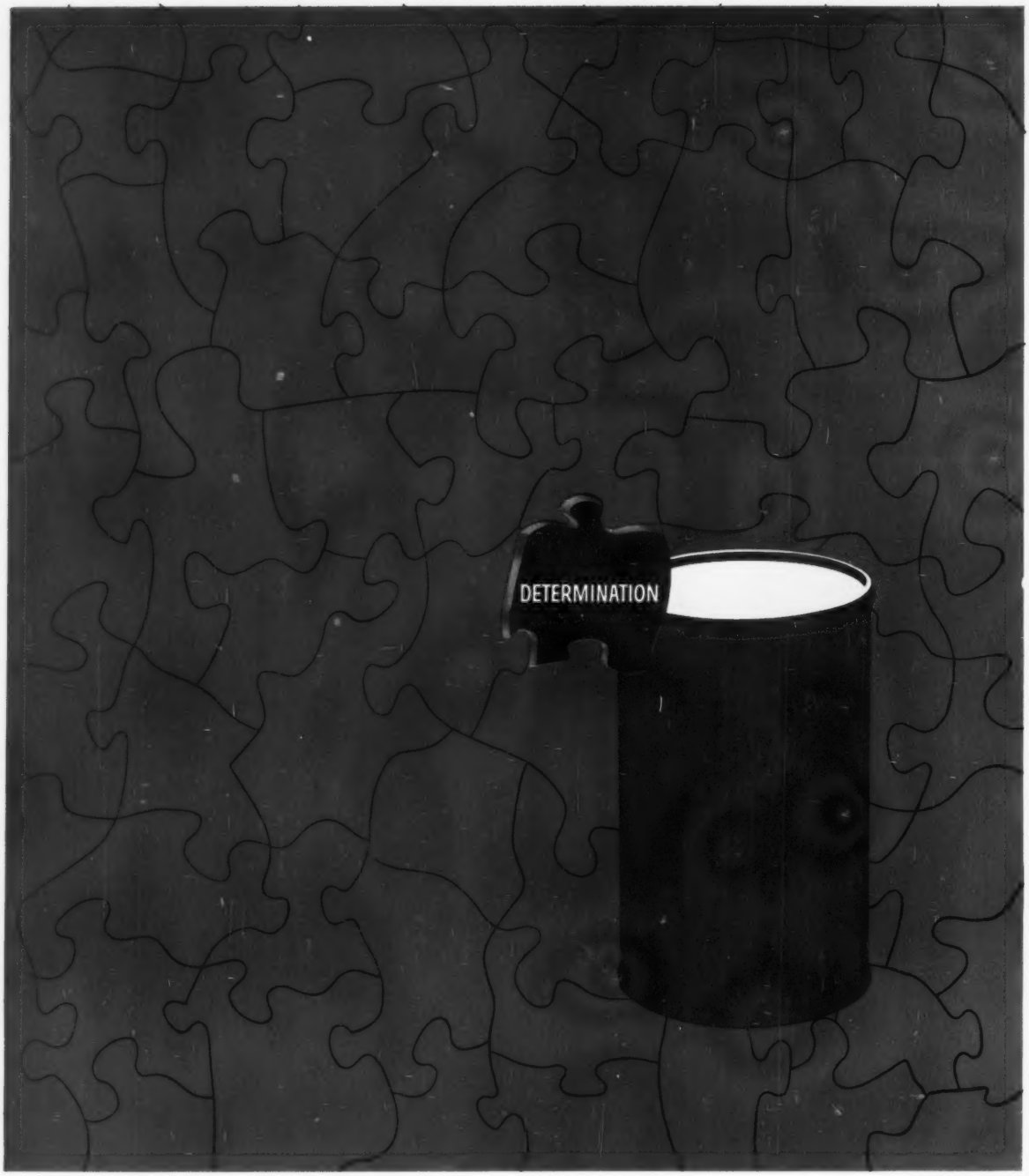
FOR MANAGEMENT IN MANUFACTURING, PACKAGING, MARKETING

A McGRAW-HILL PUBLICATION

SPECIAL REPORT—

COLOR CONTROL

NEWER INSTRUMENTS speed color analysis p. 74



Sometimes a packaging problem will have a solution as obvious as a sunset. Many of the answers, however, require a persistent search. If you've been wrestling with a packaging problem that seems insoluble, some of Canco's determination may help you solve the puzzle. It's worked before . . . many, many times! Your first step is to call the nearby Canco representative. He'll be glad to tell you how alert, imaginative Canco service can make your operation *more efficient, more profitable.* Call today!

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FOOD ENGINEERING FOR MANAGEMENT

MARCH, 1959

30th YEAR

VOL. 31 NO. 3

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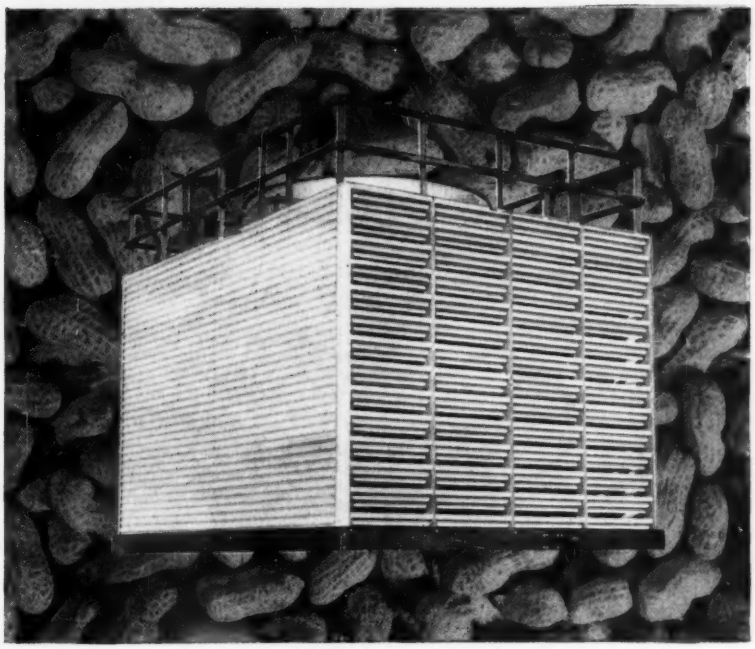

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Double-Flow Aquatower®
adds profit to peanut processing

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This compact, low-silhouette tower is saving more than 95% of the water required for processing and air conditioning. The Double-Flow Aquatower was selected for its proven ability to provide specified performance—with maximum economy and dependability, with minimum upkeep and attention. Such exclusive features as convenient access, at-a-glance inspection, and dependable Marley designed and manufactured mechanical equipment make these towers functionally simple, so no technical skill is required for long-life, efficient operation.

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Kansas City, Missouri

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Putting Ideas to Work

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TRENDS & FORECASTS

SPECIAL

FOOD ENGINEERING

SERVICE to EXECUTIVES

Total overseas sales volume of Libby is now twice prewar figure and 25% of overall volume. But exports meet stiffer competition as food processing increases abroad.

Libby will invest $50 million over the next five years for modernization and expansion. Program includes new canned meat plant and can making facilities in Chicago, can plants at other locations, several warehouses.

Wage boosts continue in food industry management-labor negotiations. Latest increases were 10 to 12¢ an hour.

Frozen fish-stick production gained 15% in 1958 comeback. Pack amounted to 60.9 million lb., 55½ million being cooked sticks.

Canned salmon packed in 1958 was up 14.2% to 3.6 million cases. Canned tuna gained 21%, amounting to 14.3 million cases.

Purchases of instant coffee in '58 were 923.7 million 2-oz. units, up 6.3%.

More than half of 2,288 food outlets surveyed now carry canned carbonated beverages, American Can reports. The survey covered 9 cities.

Supply of food fats in '59 will be about 15% above last year's 11.7 billion lb. Exports may be larger than the 2.6 billion lb. in '58.

Canned apple sauce sales were up 27% last fall, compared to last year. Sales amounted to 1.5 million cases.

Canned apple juice production increased 9.1% in '57-58 to 4,652,718 cases. Sweet potato pack was up 5.4% to 4,663,615 cases, NCA reports.

Down 5% last year, red meat production totaled 24,394 million lb. Beef was off 6%, veal 23%, lamb and mutton 3%. Pork production was about same.

America's 43 million families each bought 7½ quarts more of fresh milk in '57 than in '56, but per capita consumption was about 5 glasses less.

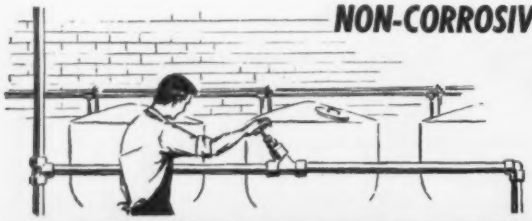
Evaporated whole milk production in '58 was lowest since 1939 and 6% less than in '57, totaling 2,295 million lb. Output of sweetened condensed whole milk totaled 55.6 million lb., 7% below '57. Nonfat dry milk production hit record 1,690 million lb., up 1%.

Supply of canned fruits is about 6% less than last year. This is largely due to 18% smaller carryover last summer and 3% smaller pack last season. Supply of canned vegetables is about 4% larger.

See Developments to Watch p. 13

Stocks of frozen vegetables on Jan. 1 were 4% smaller than a year earlier. Consumption in first quarter of '59 may not be as large as last year, when fresh items were short.

Reductions of 4% in total acreage for fresh summer vegetables, 4% for fresh fall vegetables, 9% for summer melons, and 4% for vegetables for commercial processing have been recommended by USDA.



NON-CORROSIVE... NON-TOXIC

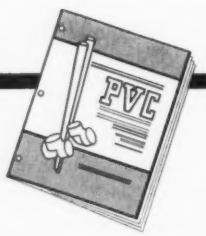
piping systems at low cost

MUELLER BRASS CO. **PVC** (POLYVINYL CHLORIDE)

RIGID PLASTIC PIPE AND FITTINGS

Mueller Brass Co. PVC rigid plastic pipe and fittings offer the food industry efficient, non-corrosive piping systems at substantial cost reductions. Solutions commonly used by the food industry, such as brine, acetic acid, alcohol, fats and oils will not corrode PVC pipe. The smooth inner wall of PVC prevents deposits from forming and allows a high rate of discharge at all times. The purity of liquids is positively protected. PVC is guaranteed non-toxic and will not impart foreign tastes or odors to the liquid it carries. Its light weight cuts installation time and expense and its permanent built-in finish reduces maintenance costs.

Low installation costs, reduced maintenance and the long, trouble-free life of Mueller Brass Co. PVC plastic pipe and fittings assure the food processor increased savings with each year of use.



NORMAL IMPACT PVC—good impact strength . . . maximum chemical resistance.

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Pipe is fabricated in 20' lengths; ½" through 3" sizes—I.P.S. schedules 40 and 80. Fittings are available in ½" through 3" sizes; threaded and socket-type for schedule 80 and in socket-type only for schedule 40.

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Schedule of Events

March

31-A2—Food & Container Assn., Research & Development Assoc., annual meeting; Hotel Statler, Wash., D. C.

April

13-17—National Packaging Assn., annual packaging exhibit; International Amphitheater, Chicago.
16-19—National Independent Meat Packers Assn., annual meeting; Palmer House, Chicago.
20-22—American Oil Chemists' Society, annual spring meeting; Roosevelt Hotel, New Orleans.
23-24—Pennsylvania Mfg. Confectioners' Assn., annual production conference; Franklin & Marshall College, Lancaster, Pa.

May

3- 7—American Assn. of Cereal Chemists, annual meeting; Statler Hotel, Washington, D. C.
4- 6—Biscuit & Cracker Mfg's Assn.; Biscuit Bakers Institute, joint annual meeting; Palmer House, Chicago.
5- 7—Purdue Industrial Waste Conference, annual meeting; Memorial Union Bldg., Lafayette, Ind.
10-13—Flavoring Extract Mfrs. Assn., annual meeting; Roosevelt Hotel, New York City.
10-14—American Society of Brewing Chemists, Silver Anniversary Convention; Queen Elizabeth Hotel, Montreal.
11-14—Assn. of Operative Millers, annual meeting; Sherman Hotel, Chicago.

HORS D'OEUVRES

▶ **Americans suffer from practically no dietary deficiencies. Obesity is our most prevalent nutritional "disease." Seems there's a tendency to die off the fat of the land.**

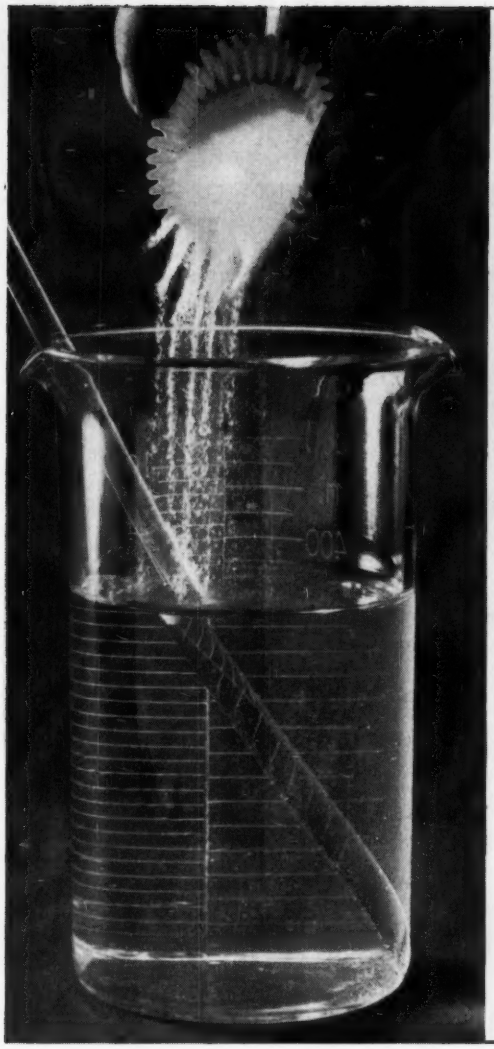
▶ **By 1975, supermarkets will be huge, circular-dome food arenas, and shoppers will get around in cartmobiles. So predicts a store engineer, who also says that the mobiles will have radar bumpers. Obviously the engineer foresees no improvement in women drivers.**

▶ To find leaks in the pneumatic lines of the Nike missile, technicians use bubble gum. Many of our space rockets have been gummed up, too.

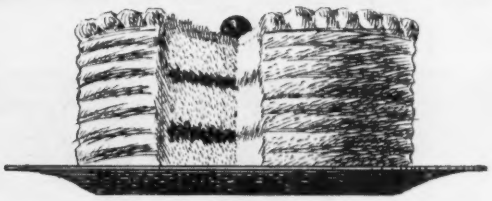
▶ **Every canner should be a press agent for his industry, says NCA President Burns. Fine idea. But no canned talks, please.**

▶ A new process is said to make good food of the dogfish shark. Now Washington State hopes to sell 10 million lb. of the fish to Japan in a new version of coals to Newcastle.

▶ **Beer advertising is illegal in Ontario. But one brewery advertises a conservation club, another a safety campaign, and a third presents do-it-yourself hints. And it is peculiar how the brand names stand out in these ads.**

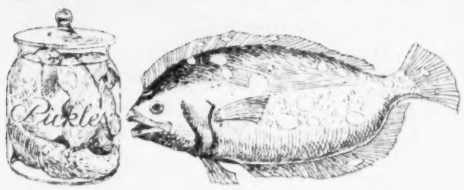


protect foods from



spoilage with

SORBISTAT®-K



...dissolves fast in water

● The ready solubility of new Sorbistat-K (potassium sorbate, Pfizer) affords you new ease in the protection of a wide variety of foods from mold and yeast spoilage. You can prepare up to 40% solutions of Sorbistat-K in water without difficulty.

Both Sorbistat-K and Sorbistat (the acid form) are effective growth inhibitors for many yeasts and molds which cause spoilage in cheese and cheese products, pickles, fish, prepared gelatin fruit salads, potato salads, chocolate syrups, pies, cake, and fruit cake.

It is important to note that Sorbistat-K *selectively* inhibits molds and yeasts, without interfering with normal microbiological curing of cheeses.

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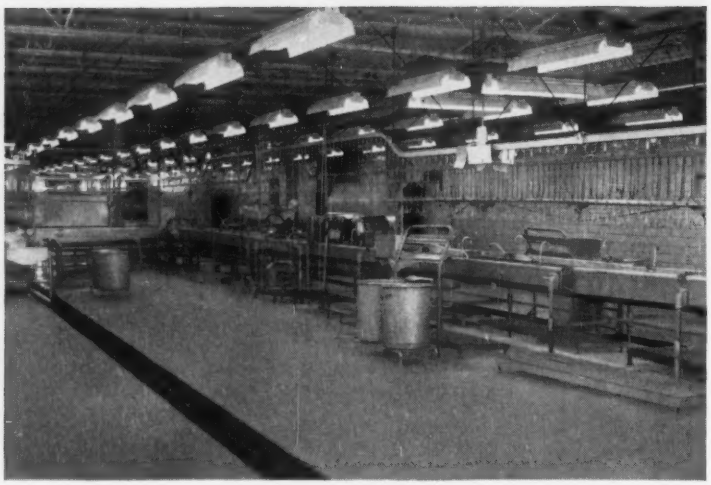

EVISCERATING AREA...

Tough cleaning job? Of course it is. But your Wyandotte representative can have your entire eviscerating operation as spotless as this in no time—whether you prefer steam-gun cleaning or hand brushing.

Superior products and methods mean better cleaning results for poultry-processing plants!

Looking for expert help in setting up your plant cleaning program? The man to see is your Wyandotte representative.

He has the know-how and experience. He can set up a complete program for your poultry-processing plant. His methods are proven in use—in plants like yours.

Top-quality cleaning products are important, too. And Wyandotte is the world's largest manufacturer of specialized cleaning products for business and industry—with a nationwide reputation for quality. Wyandotte has a complete line of general equipment cleaners, alkaline cleaners, acid cleaners, sanitizers—everything you need for a sound cleaning program.

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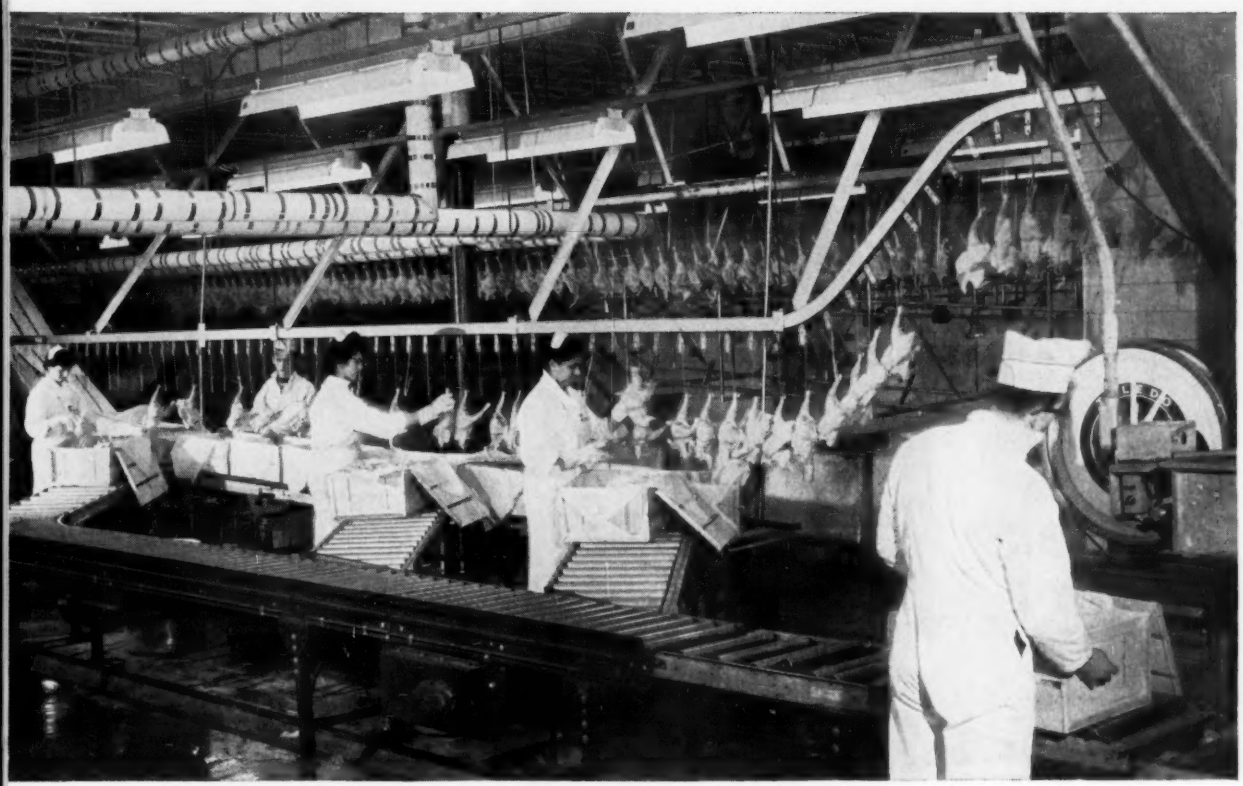
J. B. FORD DIVISION

The sanitation standard of the poultry-processing industry

CLEANING PROGRAM CAN DO!



PACKING AREA . . . Look at what a Wyandotte cleaning program has done! A sound cleaning program makes sense, in terms of higher quality, lower costs, and trouble-free operation. To set it up, you need top-quality cleaning products and a lot of know-how. That's what Wyandotte offers you!

WHATEVER YOUR CLEANING NEEDS, WYANDOTTE CAN HELP YOU!

Wyandotte Chemicals Corporation
Department 3126
Wyandotte, Michigan

Gentlemen:

☐ Please send further information on your cleaning program for poultry-processing plants.

☐ *Please send information on_____

☐ Please have your representative call on me.

Name_____

Title_____

Company_____

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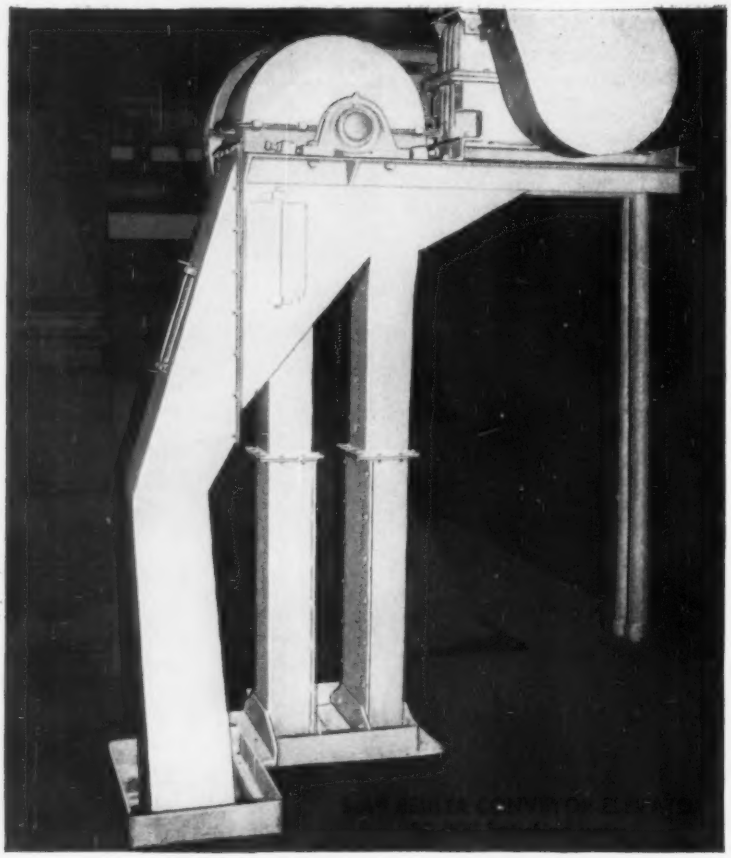
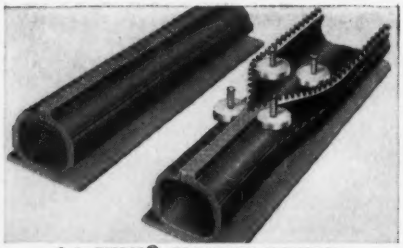
City_____ Zone_____

State_____

*Wyandotte has cleaning and sanitizing products for *all* food and beverage plant needs—and experienced men to assist with complete cleaning programs. There is a Wyandotte man near you, and his advice is yours for the asking.

STEPHENS-ADAMSON





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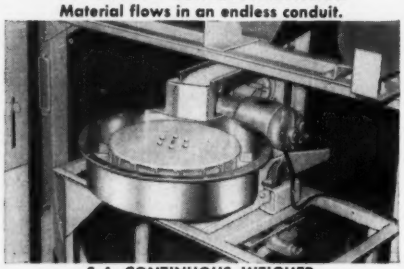
Material flows in an endless conduit.



S-A CONTINUOUS WEIGHER
Continuous accurate weighing for gravimetric feeding operations.

S-A VIBRATING CONVEYORS
Natural Frequency Conveyor

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When you invest in bulk handling equipment, the true cost is the price divided by years of satisfactory, efficient service. Unless you are presently one of the thousands of users of STEPHENS-ADAMSON Bulk Handling Systems you haven't discovered the most profitable answer to the above formula. STEPHENS-ADAMSON engineers and builds several types of conveyors for the chemical industry, each providing distinct advantages over the other for certain bulk handling situations. Thus, STEPHENS-ADAMSON recommendations are always based — not on a desire to sell a particular type of conveyor — but the most efficient type of system for the requirements involved. To acquaint you with the versatility of STEPHENS-ADAMSON engineering, we are preparing a special book on Food Handling. Write for your copy.

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- S-A SWIVELOADER® Centrifugal Thrower Units.
- S-A TELLEVEL® Automatic Bin Level Controls
- S-A CURVE CROWN® Pulleys
- S-A CARRIERS
- S-A CAR PULLERS
- S-A SHIP TRIMMER
- S-A FOOD SLICE SEPARATOR
- SEALMASTER Bearings

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BELLEVILLE, ONTARIO

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DEVELOPMENTS TO WATCH

New Swedish San-Pack preserved meat dishes are cooked twice at 212 F., with chilling in between. The purpose is to avoid heat damage to flavor. Foods are kept under refrigeration and boiled in bag before serving.

Large factory-made, translucent outside wall-panels, so light that two men can lift them into place, have been developed by Kalwall Corp. Panel consists of two sheets of polyester plastic reinforced with glass fiber and separated by aluminum dividers. It has insulating value.

Plug-in printed circuits for different bakery formulas have been developed for automatic batch make-up by Howe. Switch from one product to another can be made quickly, easily, by inserting unit in automatic weigher.

Glass roller bearing that withstands extremely high or low temperatures, is corrosion resistant, and can operate without lubrication has been developed by Corning; also a porous honeycomb glass block.

World's largest privately owned nuclear research reactor has gone into operation at Plainsboro, N. J. It is operated by Industrial Reactor Laboratories, in which Continental Can Co. is participant.

Damage to food cans by moisture condensation in holds of ships may be prevented by enclosing pallet load in sealed polyethylene cover, research at Stanford indicates.

New continuous apple juice process involves centrifuging juice from chopped fruit, then clarifying juice by filtration.

First two-armed random access memory accounting machine has been installed by R. T. French Co. It will keep up-to-second inventory control of 600 items for production scheduling and stock control.

Frozen food code covering temperature standards in packaging, storage, transportation, and merchandising have been developed by Assn. of Food & Drug Officials of U. S. Parts of code are expected to be enacted this year as law or as health official guide.

Executive development courses have been initiated by International Assn. of Ice Cream Manufacturers. Milk Industry Foundation is acting as cosponsor.

Establishment of business contacts in rapidly developing Brazil will be facilitated by an international industrial exposition to be held in Sao Paulo for 18 months, beginning April, 1960.

Polyethylene linings will be applied to a number of paper containers in the Dixie Cup line this year. Lining has high gloss, eliminates adhesive.

Method for producing metal-coated paper cheaper than paper-foil lamination is being developed by Standard Packaging.

New safety seal for clear plastic lids is leak- and tamper-proof and withstands rough handling. Announced by American Can, it is a red polystyrene ring that fits inside lid skirt. Pull-tab breaks it.

To improve quality of frozen orange concentrate, minimum ratio of sugars-to-acid has been set at 10 to 1 by Florida Citrus Commission.

Line of six cake mixes under the Duncan Hines label has been introduced by Procter & Gamble. More shortening and sugar are added by the manufacturer as a result of new processing method.

How to beat the high cost of temperature control

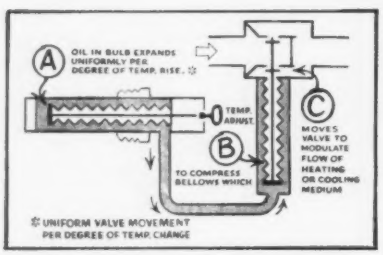
The practical approach to temperature control

By John W. Ritter, Test Engineer, SARCO Company, Inc.

Precise temperature regulation is essential in many processing operations, not only for quality control, but for maintenance of output as well.

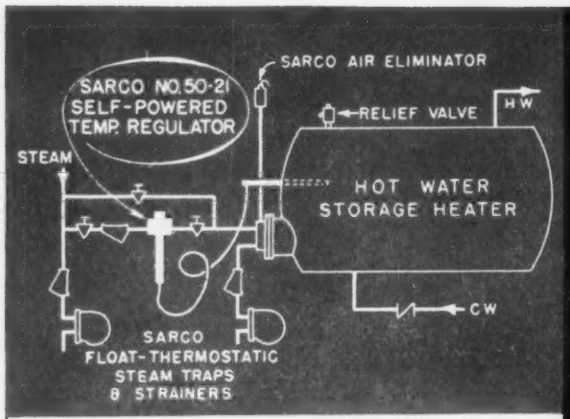
Manual temperature control is unsatisfactory because of the possibility of spoilage and loss of quality control which can result from irregular or indifferent hand regulation.

Automatic controls are available in a wide variety, including pneumatic, electronic, and self-powered. Pneumatic and electronic controls are relatively expensive to purchase and install, and may require frequent maintenance. However, in most applications, control requirements can be achieved very successfully by the use of relatively simple, economical Sarco Self-powered Regulators.


A
OIL IN BULB EXPANDS UNIFORMLY PER DEGREE OF TEMP. RISE. ✲
TEMP. ADJUST
B
TO COMPRESS BELLOWS WHICH
C
MOVES VALVE TO MODULATE FLOW OF HEATING OR COOLING MEDIUM
✲ UNIFORM VALVE MOVEMENT PER DEGREE OF TEMP. CHANGE

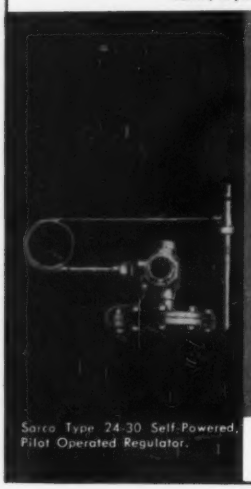
This drawing shows simplicity of operation of the Sarco 50-21 Temperature Regulator, which consists of a thermostat, capillary tubing, and a valve.

Sarco controls, like the 50-21 and the 24-30, have the required degree of sensitivity and dependability, combined with the ruggedness inherent in the sealed capillary tube construction. Because these Sarco controls do not depend on external power, such as electricity or compressed air, they have established long records of sustained, reliable operation. They are an economical and practical solution to the problem of maintaining continuous watchdog duty over processing temperatures.

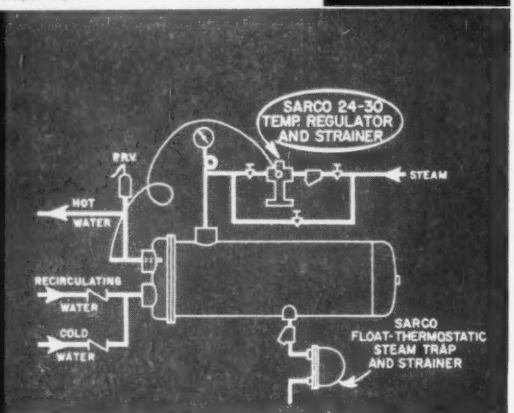


Typical applications: hot water storage heaters, shell and tube heat exchangers, condensers, oil storage tanks, dryers, kilns, etc.

Sarco Type 50-21 Self-Powered Regulator.



Sarco Type 24-30 Self-Powered, Pilot Operated Regulator.



Typical applications: instantaneous heaters, fuel oil preheaters, and all dead-end service applications.

Self-powered automatic temperature regulators by SARCO . . .

have these 5 marked advantages: No compressed air or electrical wiring required. No delicate mechanisms to adjust or maintain. No packing glands to stick or require maintenance. No shutdown during power failure. No specialized maintenance required.

Sarco Self-Powered Controls are self-contained and can be installed by any pipe fitter. They are so reasonable in cost that you can afford Sarco automatic heating controls for every application in your plant. Write for 10-page Sarco Control Bulletin No. 620.

6346-B

SARCO
COMPANY, INC.
635 Madison Ave., New York 22, N. Y.

STEAM TRAPS • TEMPERATURE CONTROLLERS • STRAINERS • HEATING SPECIALTIES

For more data, circle 254 on Reader Service Card

For more data, circle 255 on Reader Service Card

GAYLORD PACKAGING
GIVES PRODUCTS SAFE-CONDUCT

Nothing like a feeling of security when products get their travel orders, what? Gaylord corrugated boxes give safe-conduct. Strong, stout, sound, snug.
Special materials, adhesives. Most ingenious chaps, Gaylord packaging engineers.

Should you require regular containers in vast quantities, or specialized packaging, your nearby G-Man is jolly well ready to discuss economical protection. You, too?

GAYLORD
CONTAINER CORPORATION

Gaylord Boxes

HEADQUARTERS, ST. LOUIS
PLANTS COAST TO COAST

DIVISION OF **Crown Zellerbach Corporation**

THIS IS THE IMAGE OF CF&I ...MAKER OF STEEL

He's a giant steelman. He makes good steel and steel products for the diversified needs of today's economy. He anticipates tomorrow's requirements. He is constantly improving products through research and new manufacturing techniques.

His steel mills extend across the country. In them, he guards every step of manufacturing by rigid quality controls. And in his national network of offices and warehouses, he not only *sells* steel products, but he *serves* their users in every possible way.

He is the dynamic image of CF&I . . . the symbol of dependable steel products. Look for him when you buy.

6583-A

THE COLORADO FUEL AND IRON CORPORATION

DENVER • OAKLAND • NEW YORK

CF&I STEEL

Now from Du Pont Research comes a new kind of paint that definitely *retards the spread of flame.*

Rigorous testing by Underwriters' Laboratories has proved conclusively that Du Pont Fire Retardant Paint helps answer the plea of firemen to "Find a way to give us a 5-minute jump on most fires and we can control them."

Du Pont Fire Retardant Paint is a durable, washable interior flat finish that *looks, applies and wears like regular flat wall paint.* It can be brushed, rolled or sprayed . . . comes in seven eye-pleasing colors: Sunlight Yellow, Pale Blue, Daylight Green, Light Green, Pale Pink, Guards Gray, Ivory—and White.

Du Pont Fire Retardant Paint may well be "the ounce of prevention" that helps save you from a disastrous fire loss. Send today for your FREE copy of the Du Pont Fire Retardant Paint folder. Just clip and mail the coupon below.

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

E. I. du Pont de Nemours & Co. (Inc.)
Finishes Division, Dept. FE-93
Wilmington 98, Delaware

Rush! Please send me a FREE copy of your Fire Retardant Paint folder.

*Name*_____ *Company*_____

*Street*_____

*City*_____ *Zone*____ *State*_____

For more data, circle 257 on Reader Service Card

GOT A FOOD PROCESSING PROBLEM

Sunkist technical advisers...over 400 different citrus products for industry...can help you solve it!

SUNKIST KNOW-HOW produces the finest citrus products to be had. That same know-how—the backlog of more than 60 years experience—and those citrus products—over 400 of them—can help solve your food processing problem.

Every course on the American menu has profited from Sunkist research or Exchange products. We've made a good condensed soup glorious by adding a few ounces of Exchange Lemon Juice to *100 gallons* of it. We have stopped pies from "bleeding" by using Exchange Low Methoxyl Pectin in the filling.

And between soup and dessert, we've devised enough manufacturing processes for the benefit of the American food processor to get Sunkist 118 separate U.S. patents!

Sunkist technical experts will be glad to work *with* you—in your own plant—or *for* you—in their own citrus research department. Write—or, if it's urgent, telephone—and a Sunkist man will call on you.

EXCHANGE BRAND CITRUS PRODUCTS widely used by leading food processors include: *Lemon Juice...Orange Juice...Orange Oil... Lemon Oil...Frozen Orange Puree...Frozen Lemon Puree... Preserver's Pectin...Low Methoxyl Pectin.*

Sunkist Growers

Exchange

PRODUCTS SALES DEPARTMENT • ONTARIO, CALIF.

Focus on Additive Safety, Testing

FDA was bustling, as this was written, to issue its final Food Additive Amendment regulations.

As the deadline day—Mar. 5—approached, industry was seen winning modifications on two "objectionable" proposed regulations—the requirement for a 100-to-1 safety factor in tolerances assigned additives, and the requirement restricting industry to testing methods prescribed by the National Research Council "unless another method is shown to be equally reliable."

Industry had, further, sought permission to label additives merely by their functional names ("emulsifiers," "preservatives", etc.). But Commissioner Larrick continued to insist that public protection will suffer unless ingredients are directly specified on the foods.

FDA would, however, like to see simpler names developed for the additives. Accenting such need was word last month that the Agency had set tolerances for residues of (take a breath) 1,2-dihydro-6-ethoxy-2,2,4-trimethylquinoline (0.5 ppm. in or on uncooked meat, meat byproducts, and muscle meat and eggs of poultry; 3.0 ppm. on uncooked liver and fat of poultry).

Price Factors Become Top Target

Spotlights are centering on price practices from several directions at once.

For one thing, small business supporters, widely representative of the food field, are heavily backing the "equality of opportunity" bill. By reversing a 1951 Supreme Court ruling, this measure would restrain a seller from cutting his price to a chosen few customers in order to meet competition.

Similar shooting fell short in the last few Congresses. But if supporters can get the bill up for a vote in both Houses, it will pass. However, opponents have just won another delaying round of hearings.

Further, there are the special investigations being sparked by both the President and the Congressional Democrats to delve deeper into price practices. The Administration's major study, headed by V.-P. Nixon, will center on distribution factors. Particular attention will be given to the spread between prices paid to farmers and those paid by consumers.

Some of the Congressional gunning is most specific—as in the case of the current bread-price probe by Sen. Kefauver. One of the Tennessee Senator's ultimate aims is a cabinet-level Department of Consumers.

Also keyed to the price question is FTC's continuing check of retail-sphere "power concentration".

Benson 'Up Against It' on Farm Bill

Looking Agriculture Secretary Benson squarely in the eye during a recent hearing, House Agriculture Chairman Harold Cooley (D., N. C.) said—

"Congress will give you any authority you want, except what you want . . ."

This is a fair summary of the chances—virtually nil—for a major farm law revision along the lines favored by the Administration.

Prime desire of Benson and the President is to abandon the old parity reference-point principle and, instead, range price supports as 75-to-90% of average market prices of the 3 yr. immediately past.

But this is called "totally unacceptable" by the farm-state Democrats in Congress. Their leaning, rather, is in the direction of the old Brannan Plan. In short, they are seen proposing Government estimates of the domestic market and allotment to each farmer of a share, based on his past production history. Then direct Federal subsidy would make up a pre-determined percentage of the difference between the forecast market and the farmer's actual return.

However, this is just as unacceptable to the Administration, which clings to its goal of getting out of—instead of deeper into—the farmer's business.

Users Oppose 'Permanent' Sugar Act

Both Houses of Congress have filed strongly supported bills that would indefinitely extend the Sugar Act.

But such indefinite prolongation doesn't set well with members of the Industrial Sugar Users Group, who don't care for "permanent inclusion of all the features in the Act which jeopardize sugar supplies and contribute to higher sugar prices." They want not only modifications but limited extension.

PVC Film OK'd; One Nylon Checked

First PVC film (extruded plasticized polyvinyl chloride) approved by FDA for food packaging is Vitafilm F. Made by Goodyear, it's a 1-mil product rolled out at 21,500 sq. in./lb. and priced at 73¢/lb.

Its suitability for either straight or overwrap applications is cited by maker, who adds that it readily laminates to paper, foil, or other film to produce special pouch-type packages.

BRIEFS

Waxes on milk cartons suspect? Mention of "recent disturbing reports" to this effect are now discounted by FDA, which says, no complaints have been received. But not having tested these substances earlier, FDA has now launched limited research, commenting that it is only concerned that the waxes "might possibly be carcinogenic." More intensive study of matter has been initiated by American Petroleum Institute.

Citrus Red No. 2, dye to replace banned Red 32 for coloring of oranges, has now won Senate O.K. Quick House approval and Presidential signature are expected to follow. . . . Meanwhile, FDA has delisted (effective in late April) the long-questioned FD&C Yellows Nos. 1, 2, 3, and 4.

Adding gluten to rolls and buns—a standard change pushed by Hercules Powder Co.—is seen getting FDA's greenlight late this month. Weight ratio: 4 parts per 100 parts flour.

For more data, circle 259 on Reader Service Card→

Fred Wheelwright, Industrial Sales Manager: "The panels to the right deal with three distinct areas of processing . . . separation of liquids; heat exchange and recovery, and separation of solids. In all three, De Laval equipment offers absolutely top-notch *efficiency* coupled with *high capacity* and *continuous operation.*

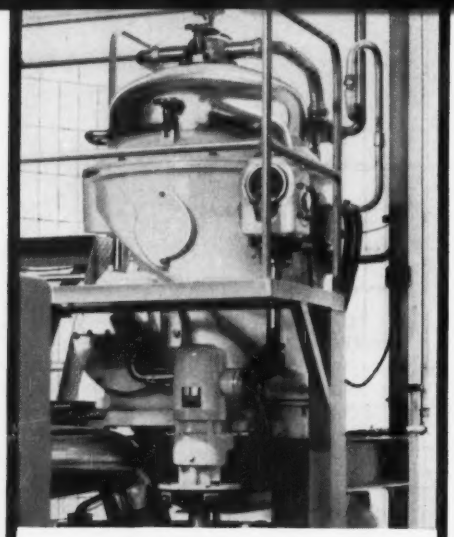
"De Laval centrifugal separators are designed for purification or clarification of liquids, or the concentration and recovery of solids from a liquid. De Laval Plate Heat Exchangers are used for product cooling or heating and for the recovery of process heat from sources otherwise going to waste. The "Syncro-Matic" Separators handle all sorts of solids . . . wet or dry; fine or coarse, heavy or light . . . in all sorts of classification and separation processes. In all of these areas the efficiency of De Laval equipment is unsurpassed; in many areas, it cannot be equaled.

"For more information on these, or any other De Laval products, just mail your request on your letterhead. No obligation, of course."

DE LAVAL

THE DE LAVAL SEPARATOR COMPANY
Poughkeepsie, New York
5724 N. Pulaski, Chicago 46, Illinois

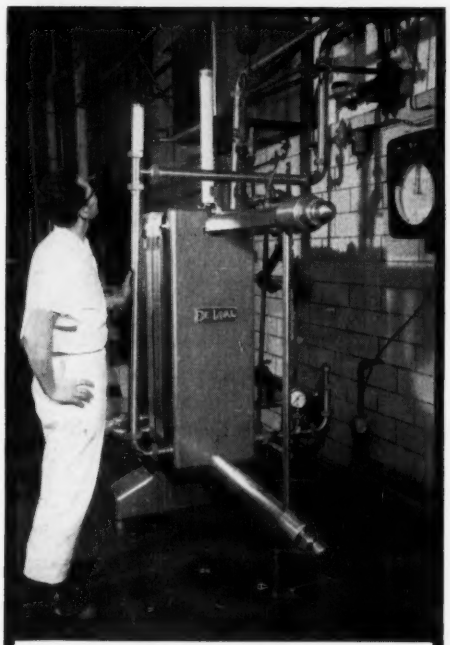
DE LAVAL PACIFIC COMPANY
201 E. Millbrae Avenue, Millbrae, California



FIVE MINUTES FROM RAW MATERIAL TO FINISHED FAT AT 98 – 99.5% EFFICIENCY

The system which makes this possible is the De Laval Continuous Centriflow Rendering Process. A De Laval exclusive, it was designed with emphasis on producing the highest quality edible fat possible by reducing process time to a minimum under closely controlled temperature conditions. Extremely versatile, the Centriflow System produces fat in the range of from 98 – 99.5% fat recovery. Personnel and space requirements of the Centriflow Process are reduced to a bare minimum. Vital parts of the Centriflow process are two types of De Laval continuous centrifugal separators, the Self-Opening AFPX Centrifuge (shown above) and the De-Sludger. These may be applied in existing operations to increase plant efficiency and improve product quality. The De-Sludger separates rendered fat and high protein solids continuously under controlled centrifugal force. The Self-Discharging AFPX removes the final traces of water and proteins that may be present and discharges the solids automatically for continuous-flow processing. If high capacity, continuous separation can contribute to the efficiency of your processing, why not contact De Laval? De Laval manufactures a centrifuge of the right size and capacities for every processing need.

GET MAXIMUM PROCESSING EFFICIENCY WITH DE LAVAL



ABSOLUTE TEMPERATURE CONTROL *PLUS* HEAT RECOVERY EFFICIENCY UP TO 95%

The De Laval Plate Heat Exchanger enables you to maintain as little as 3° temperature differential between your product and the heating or cooling medium. Equipped with De Laval's exclusive Vacuum Steam Heating System, the unit responds *immediately* to changes in operating conditions and will hold to within 1° of preset temperature for as long as you wish. Food processors have also found the Plate Heat Exchanger a source of profitable savings, using it to recapture process heat now being wasted and incorporating it into their heating system. Each unit is custom-tailored to your exact needs. The Plate Heat Exchanger offers multiple benefits: corrosion resistance, easy cleaning, lack of maintenance problems. Plate design offers adaptability and elimination of thermal shock or product burn-on plus highest heat transfer efficiency.

De Laval's Plate Heat Exchanger has found enthusiastic reception throughout the food process industries. The illustration shows a unit installed at Cantrell & Cochrane, Englewood, N. J., makers of C & C Super Coola and other beverages. This unit preheats, sterilizes and cools 7500 pounds of chocolate drink per hour.

***NOW*... A VIBRATING SCREEN SEPARATOR WITH MOTION CONTROLLED IN ALL THREE DIRECTIONS**

Horizontal, vertical, and gyratory motion are *all* individually controlled in De Laval's "Syncro-Matic" Separator with TDM (three dimensional motion) Control. It means a tremendous increase in throughput as well as an extraordinary increase in efficiency of separation. Calibrated controls indicate adjustment ranges for frequency and each element of motion. Once the optimum settings for a product have been determined, they can be noted and reset for immediate top efficiency whenever the same product is to be processed again. The action is not affected by a varying feed rate; efficiency is constant whether the machine is set for gentle or turbulent action. The machine is available in carbon or stainless steel with from one to three decks and a full range of screen meshes and materials. It requires no special mounting, and can be easily moved from one location to another. The base of the machine is practically vibrationless, and operation is exceptionally quiet. The "Syncro-Matic" has been successfully applied in a wide variety of food processing operations. It may well be the perfect solution to your own screen separation problems.

PROCESS EQUIPMENT

CENTRIFUGES

PLATE HEAT EXCHANGERS

VIBRATING SCREENS

COMPLETE PROCESSES

NEW PACKAGES & PRODUCTS

Introduce New Hamburger "Steak"

Introduced as the first hamburger "that actually looks like a steak" is Pfaelzer Bros. Melbro Hamburger Steak. Molded in the shape of the meat packer's boncless sirloin strip, the hamburger weighs 8-oz. and contains less than 15% fat.

Another new Pfaelzer product is sliced liver uniformly molded in the natural half-moon shape. The liver is completely deveined and skinned.

Both the hamburger and the liver are blast frozen to seal in flavor and layer packed for ease of removal and use.

New Safety Seal for Cups

American Can Co. has announced development of a "safety seal" for clear plastic lids used on paper cups.

A red polystyrene ring fitting securely inside the lid skirt, the seal is removed by pulling on a small tab before lifting the lid. This breaks the brittle ring but leaves the lid itself intact.

The seal will insure longer shelf-life for products, make the package leakproof and tamperproof.

Rings are fitted in the closure at the factory. Closing of the filled cups may be done by hand or automatically.

Circle 1 on Reader Service Card

All-Season Coffee Label

A brightly lithographed "picture label" is now used by Colonial Stores, Atlanta, Ga., for its coffee.

Supplied by American Can Co., the new cans use a bright yellow background designed to give them extra eye appeal on supermarket shelves.

Pictured on the label are a cup of hot coffee and a glass of iced coffee, making the package a year-round seller.

The lid is used for directions on brewing percolator, drip, or vacuum coffee. Color scheme here is brown type on a bright yellow background.

Circle 2 on Reader Service Card

Two New Spaghetti Products

Campbell Soup Co. has announced two new products marketed under the Franco-American label. Italian-style spaghetti and spaghetti with ground beef.

The Italian-style spaghetti is a thin spaghetti with a special Italian style sauce that contains seasoning, spices, and three cheeses.

The second product is similar but has braised beef added.

Both products were introduced as the result of research with nation-wide consumer panels. Point of sale materials will include a case card and shelf talker for each new product and a reusable dump display bin.

Double-Wrap Cake Mixes

Striking package design is sure to call consumer attention to the Duncan Hines cake mix line just introduced by Procter & Gamble. Full color illustrations of the prepared cakes are printed on the overwrap for a new, shorter carton shape.

The mixes are made in six flavors: white, yellow, burnt sugar, devil's food, fudge-marble, and spice. A new method used by the processor enables them to add more sugar and shortening in preparing the mix.

The mix itself is packaged in a sealed polyethylene envelope before packing in the overwrapped carton.

New "Duplex" Pizza Package

Newest idea in fractional packaging is Sealright Co.'s new Totem-Pak: A half-pint container that fits into a glassine-lined paper cylinder.

Papa Leo's Italian Kitchens, Little Falls, New York, is using Totem-Pak for its frozen pizza product. The pizza sauce is packed in the upper container, the pizza dough in the lower one. A flat plastic bag containing grated cheese is inserted between the two containers. The package may be used for a variety of products, ranging from ice cream to cake and cookie mixes.

Circle 3 on Reader Service Card

Self-Contained Produce Carton

"Grab appeal" is the phrase Mead-Atlanta Paper Co. uses to describe its new Arm-Lock patented produce carton. The package presents high product visibility insuring the consumer that the fruit or vegetables are fresh.

Advantages to the packager are many: Carton adjusts to various sizes of fruits and vegetables; It needs no film overwrap or closing equipment; the tough Kraft reduces product damage and withstands water absorption.

Since carton flicks open at a touch only one person is needed to pack, lock, and price.

Circle 4 on Reader Service Card

Appetizing Bacon Packages

Mouth-watering 4-color illustrations keyed to the four seasons are the highlight of Peet Packing Co.'s cartons for 1-lb. packages of Farmer Peet's Bacon.

Accompanying each realistic picture on the backing of the overwrap package is the recipe for preparing the bacon.

Printed in 4-color offset on cold wax meat board, the illustrations were designed and produced by Container Corp. of America.

Pictured are bacon recipes for the Christmas-New Years holidays, Fall, Spring, and summer.

Circle 5 on Reader Service Card

NEW LOW COST AUTOMATIC BATCHING
WITH INSTANT FORMULA CHANGING

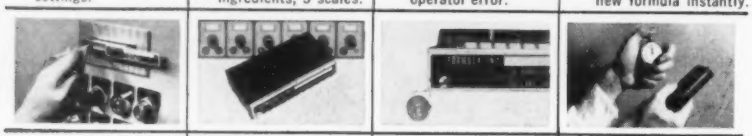
HOWE
BATCHPLUG

1 Quickly and easily adjusted to accurate settings.

2 Each standard Batchplug controls up to 10 ingredients, 3 scales.

3 Sealed for privacy—no dials to reset—no operator error.

4 Inserting Batchplug changes entire plant to new formula instantly.



The Howe BATCHPLUG cuts panel and circuit costs—puts automatic batching in everybody's reach! Simple, rugged, easily set for any formula up to 10 ingredients. An exclusive Howe development!

HOWE
THE HOWE SCALE CO. • RUTLAND, VT.
A SUBSIDIARY OF SAFETY INDUSTRIES, INC.

WRITE TODAY FOR OFFICE DEMONSTRATION OR NEW BATCHPLUG FOLDER

New Packages and Products

CHOCOLATE SYRUP packed in pressure can is the newest Nestle product to be marketed in the lower New England Area. The product can be stored at room temperature. The product is an indication of the growing acceptance of aerosol packaging (FE Feb., pp. 62-63). Cans are supplied by Precision Valve Co.

Circle 15 on Reader Service Card

Tests New Juice Concentrate

Testing in Syracuse, Houston, and Cincinnati is a new Minute Maid orange juice concentrate which, says the packer "is literally indistinguishable from freshly-squeezed orange juice."

The new processing technique will be used for about 20% of the 1959 pack and for all of the 1960 pack.

New Product Shorts

Entrees for Two are now marketed by Birds Eye Frozen foods divisions. Selections are haddock, beef, turkey, and casserole.

National Introduction of Post Sugar Coated Corn Flakes has been started by General Foods.

Additions to frozen seafood line of Booth Fisheries Corp. are headless shrimp in the shell, breaded fantail shrimp, and breaded fishsticks.

Dietetic Beverage called Slim-Trim, processed by Central Canning Co., Inc., is now marketed in fruit punch and orange flavors.

Concentrated Tomato Juice from H. J. Heinz is now national distribution. Concentrate is packed in 6¼-oz. can, making 1½ pt. of juice.

Banana Bread Mix is new product of 6 O'Clock Foods.

For more data, circle 260 on Reader Service Card

Royal has a reason . . .

Really good pudding and pie filling is hypersensitive to moisture. To get the very best protective package for famous Royal Puddings . . . and at moderate cost . . . Standard Brands selected a special Riegel laminated glassine. Result: Absolute assurance that delicately flavored contents and moisture-bearing air will not meet.

Extra benefits can be yours, too. "Protected by Riegel" means positive protection all the way . . . *plus* flexible packaging materials that are:

- . . . tailored to run at high speeds on automatic machines
- . . . made to your own specifications; printed, waxed, coated and laminated combinations of all types
- . . . priced to give the best possible protection at the lowest unit cost.

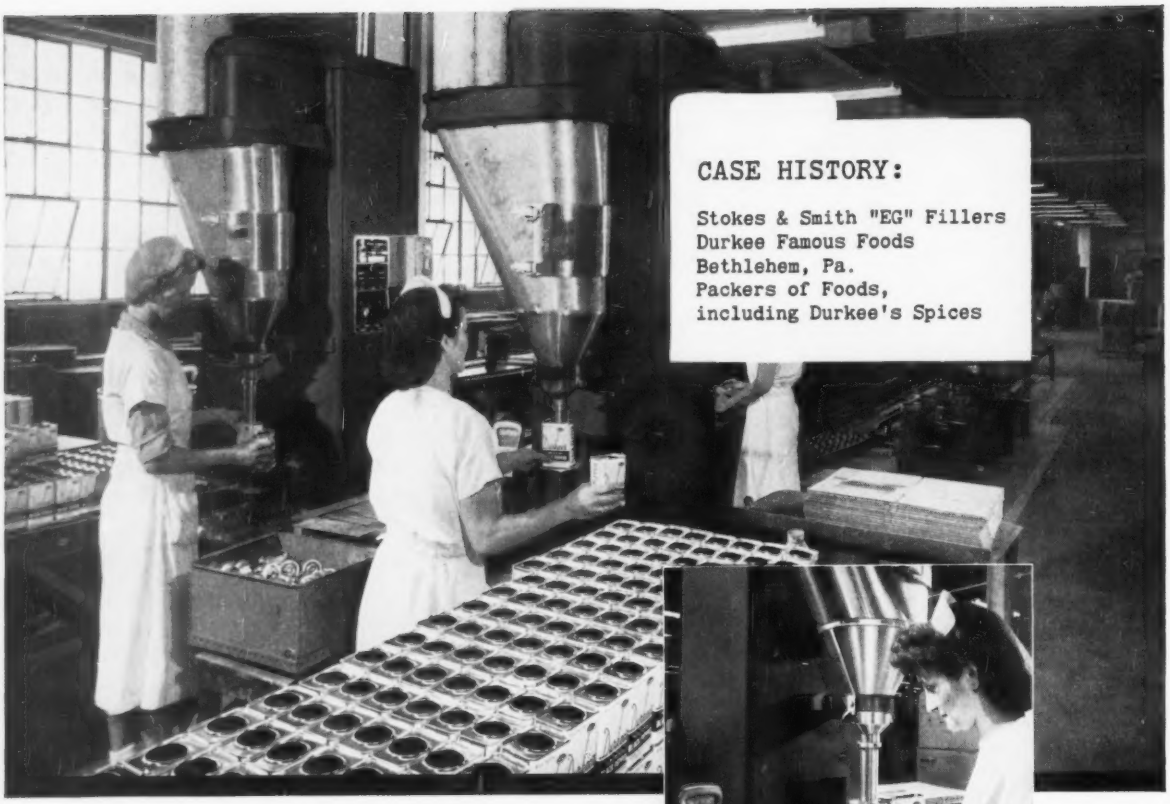
Hundreds of today's best-sellers benefit from Riegel's uniformly effective product protection. You can, too. Write Riegel Paper Corporation, 260 Madison Avenue, New York 16, N. Y.

Riegel

PROTECTIVE PACKAGING MATERIALS

Royal Chocolate Pudding is protected by one of over 600 Riegel tailor-made papers, a special laminated glassine made to run at high speed on Pneumatic Scale equipment.

*TM



CASE HISTORY:

Stokes & Smith "EG" Fillers
Durkee Famous Foods
Bethlehem, Pa.
Packers of Foods,
including Durkee's Spices

Operator spot checks package weight. Dependable accuracy of "EG" Fillers has eliminated "shrinkage" caused by overfilling.

"EG" Fillers nearly double production while slashing "shrinkage."

"Since we replaced our filling equipment with Stokes & Smith "EG" Fillers, we've almost doubled production with no increase in the number of machines," reports Durkee Famous Foods, Division of Glidden Company. "At the same time, 'shrinkage' has been substantially reduced because filling is accurate."

"Besides saving us money, the machines have made it possible for us to increase our range of containers. Without complicated changeover, we now fill eight ounce cans, 16 ounce cans and glass, five pound cans and six pound sizes in cans and cartons."

In addition to handling a wide variety of container types, the "EG" Filler offers four filling methods to meet specific requirements – cam controlled auger, pressure packing, gross weight or combination auger-vacuum. Extreme flexibility and quick changeover make this unit ideal for short runs and off-size containers.

FOR COMPLETE INFORMATION, ASK FOR BULLETIN P-802-R.

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION

FMC Packaging Machinery Division

Stokes & Smith Plant
4914 SUMMERDALE AVENUE, PHILADELPHIA 24, PA.

For more data, circle 262 on Reader Service Card

MULTI-PACK contains five 1-qt. envelopes of Carnation Instant. Now being introduced on a national basis, the new package offers retailers the advantages of higher volume and profit. And the new multi-pack occupies a minimum of shelf frontage.

Packaging Briefs

First Place Honors for design and eye appeal of its foil label have been awarded to the Gunther Brewing Co., Baltimore, for the 4th consecutive year by the Brewers Association of America.

Polyethylene Tube with an elongated nozzle for convenience and ease in decorating is the package for Cake-Mate decorating jelly.

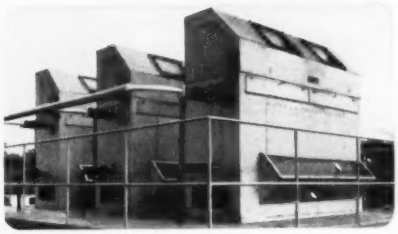
Simplified front panel for better shelf visibility marks new National Sugar Refining Co.'s package for Jack Frost sugar. Back panel offers recipes.

PORTION CONTROL takes a new turn in this retail pack which offers three individual servings of cut corn. Each serving is packed in a boilable pouch (8 min. of boiling is needed to prepare) with a pat of butter. Packer is Shoreland Freezers, Salisbury, Md., who is also marketing green peas, baby limas, and mixed vegetables in the same style package.

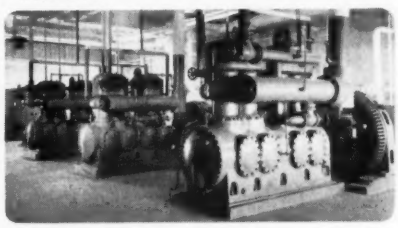
MODERNIZING?

Check TRADE FRICK MARK® Refrigeration FOR ALL YOUR NEEDS

- [V] CONDENSERS
- [V] PIPE COILS
- [V] SHELL-ICE MAKERS
- [V] VALVES & FITTINGS
- [V] ICE RESERVE UNITS
- [V] AIR HANDLING UNITS
- [V] SHELL & TUBE COOLERS
- [V] "ECLIPSE" COMPRESSORS
- [V] HEAVY-DUTY COMPRESSORS
- [V] QUICK-FREEZING SYSTEMS
- [V] "INSTANT" WATER COOLERS
- [V] MULTI-STAGE COMPRESSOR SYSTEMS
- [V] LOW PRESSURE REFRIGERATION UNITS
- [V] AUTOMATIC CONTROLS & DEFROSTING SYSTEMS
- [V] [V] COMPLETELY ENGINEERED SYSTEMS, DELIVERED AND INSTALLED



Frick Evaporative Condensers Save Up To 95% Of The Water Used.



Frick Heavy-Duty Four Cylinder Compressors Can Be Adapted to Handle Any Type of Refrigerant.

Frick Shell-Ice—Clear Solid Pieces of Curved Ice. Made Automatically, Without Snow or Waste.

It is a proven fact that today's semi- and full-automatic equipment soon saves enough to pay for itself.

Whatever the refrigeration requirements of your plant—quick freezing, ice making, cold storage, humidity control, low temperatures, condensing, air conditioning, or any process cooling . . . Frick engineers will help you modernize your present system or design one to meet your needs.

Frick refrigeration equipment is world renowned for a long trouble-free life of dependable operation. Many Frick compressors have been in operation for over 40 years.

CALL your nearest Frick Branch of Distributor today. Or write direct to . . . . .

DEPENDABLE REFRIGERATION SINCE 1882
FRICK CO.
WAYNESBORO, PENNA., U. S. A.

For more data, circle 263 on Reader Service Card

LACTOSE: APPLICATIONS UNLIMITED

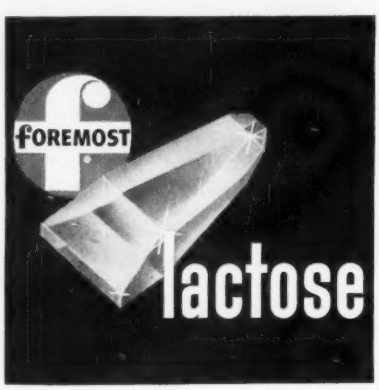
MILK SUGAR

VERSATILE is the word for Lactose (milk sugar). New food industry uses are being reported nearly every week. There is literally no end to the product-improving applications for this low sweetening, free flowing sugar.

For example, Lactose enhances flavors. It is an excellent pigment absorbent and aroma catcher. It forms a superior dispersing agent for high-fat powders. It improves browning and caramelization. It controls sugar crystallization for superior uniformity.

Only Western offers you all forms of Lactose... 5 grades, 10 basic granulations (custom granulations, too). And you can depend on Western for prompt delivery and the uniformly high quality you need.

Find out how Lactose can help your product improvement program. Tell us the applications you are considering. We'll send you full information and samples. Address: Technical Service, Department 16C.

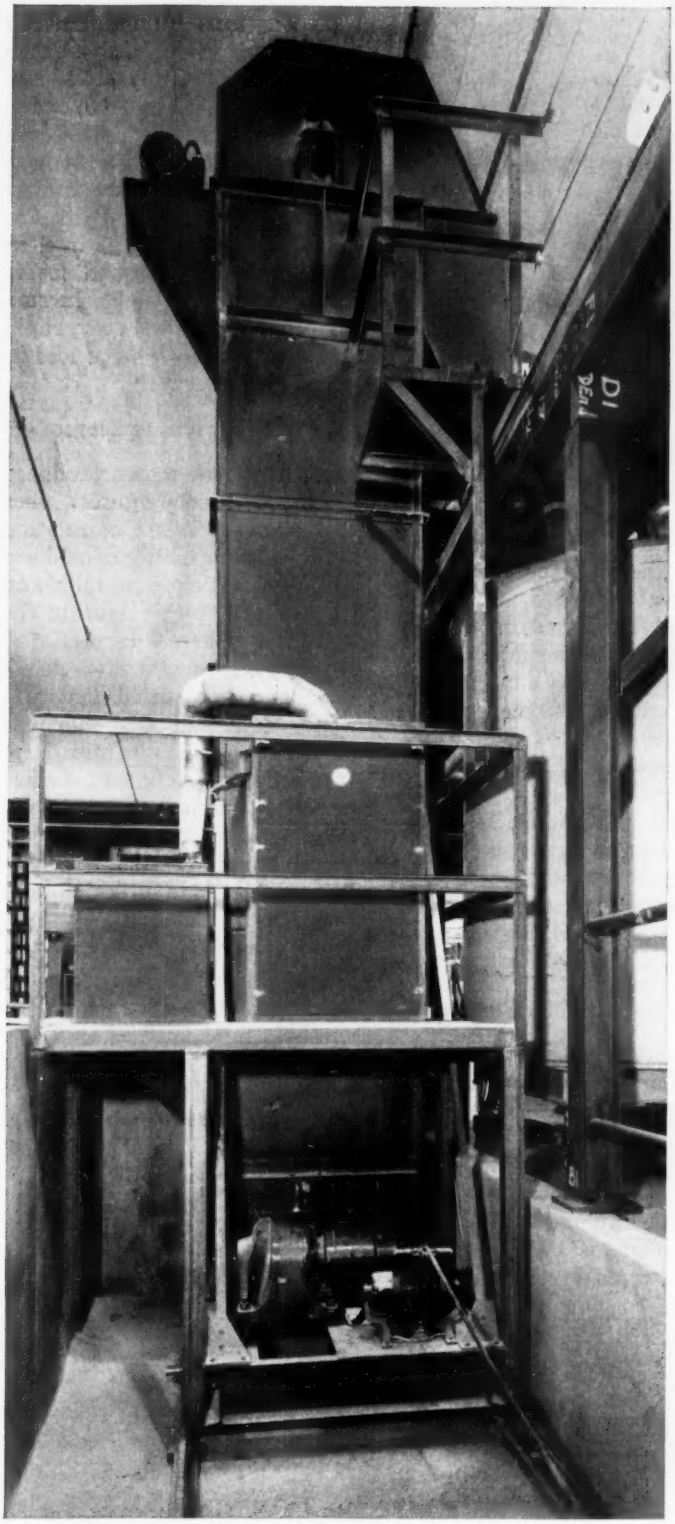


WESTERN CONDENSING COMPANY

Appleton, Wisconsin

WORLD-WIDE SUPPLIER OF HIGH-QUALITY MILK DERIVATIVES

No assembly problems with bucket elevators **LARGE** or **SMALL**!



TRAVELING BUCKET ELEVATOR. This Link-Belt centrifugal discharge bucket elevator, mounted on a steel, self-propelled carriage, travels along rails and serves a line of processing tanks.

LINK-BELT makes all elements for bucket elevators

RESULT:
easier installation
smoother performance

If bucket elevator components don't match perfectly, time and effort needed for assembly can send installation costs skyrocketing. And if misalignment isn't corrected, it soon shows up in bucket and casing wear, undue drag and friction, excessive maintenance and downtime.

Integrated Components

Link-Belt prevents these costly installation and operational headaches . . . eliminates them in the *factory*, not in the field. Making *everything that goes into a bucket elevator*, Link-Belt carefully designs, manufactures and integrates all components for perfect, ready alignment. As a result, unnecessary erection costs and difficulties are avoided . . . efficient, long-lasting elevator performance is assured.

One-Source Service

Equally important, the completeness of Link-Belt's line makes it easy to select the proper type bucket elevator and components best suited to your material and capacity requirements. Link-Belt will erect your elevator and accept full installation responsibility. For complete details, contact your nearest Link-Belt office.

LINK-BELT

BUCKET ELEVATORS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World 14,917

Aluminum Foil Packaging–Light Barrier and Vitamin Protector

Report No. 19 of a Series by Reynolds Metals Company

An early report, No. 6 of this series, presented the advantages of aluminum foil as a light barrier particularly in regard to prevention of oxidative rancidity in products containing oil or fat. Numerous experiments were cited showing the catalytic effect of light as a major contributor to this common form of food deterioration. Report No. 14 dealt with the effects of light on vitamins in enriched, partially baked rolls.

Milk—a Dramatic Example

Of the great number of food products affected adversely by light, however, milk is perhaps the most dramatic example.* Light acts upon milk principally in the following ways: (1) by catalyzing the oxidation of ascorbic acid, (2) by causing the destruction of Riboflavin and Vitamin A, and (3) by stimulating the development of oxidized and activated flavors.

A series of tests conducted for Reynolds Metals Company by the Wisconsin Alumni Research Foundation compared various types of milk in four types of containers: clear glass, brown glass, waxed carton and aluminum foil carton. The milk thus packaged was exposed to both fluorescent light and sunlight. The fluorescent lighting was designed to simulate conditions in a supermarket —the product being placed in an open top refrigerated display case maintained at 50° F., with the lights developing an intensity of about 100 foot candles. Tests under fluorescent light were made prior to exposure, then after 3 and 10 days. Those using sunlight were made prior to exposure, then after 30 and 120 minutes.

Summary of Test Results

Summarizing the separate tests measuring vitamin content before and after the indicated light exposures, the results were as follows. For Riboflavin (Vitamin B_2), no losses of nutritional significance under fluorescent light, but substantial losses in sunlight for milk stored in clear glass and waxed cartons — aluminum foil and brown glass affording excellent protection. For reduced Ascorbic Acid (Vitamin C), much slower rate of loss for milk stored in aluminum foil and brown glass —the pattern appearing similar in fluorescent and sunlight. For Vitamin A, only the milk in clear glass containers showed losses under fluorescent light; in sunlight these losses were very rapid and there was also some loss in waxed cartons.

Tests for Flavor Scores

Tests for flavor scores produced findings of special interest, since there appears to be a correlation between the formation of oxidized and hay-like flavors in milk and the loss of Ascorbic Acid. In the Table shown here, all scores of 35 or under represent a flavor defect — a definite oxidized flavor in whole milk and a pronounced hay-like flavor in skim milk. Here even brown glass failed to retard materially the flavor change. Only the aluminum foil carton proved effective under fluorescent light. And the results in direct sunlight were almost identical.

Manufacturers concerned with vitamin retention, or with other effects of light, such as oxidative rancidity, are invited to call the nearest Reynolds sales office. Or write to **Reynolds Metals Company**, Richmond 18, Virginia.

*Remainder of this report summarizes findings by the Wisconsin Alumni Research Foundation, as set forth in an article entitled "The Effects of Light on Homogenized Whole Milk and Some Fortified Milk Products", by J. J. Birdsall, L. J. Teply, P. H. Derse, in *Food Technology*, Dec., 1958, Vol. 12, No. 12, Page 670.

FLAVOR SCORES OF FOUR TYPES OF MILK STORED UNDER FLUORESCENT LIGHTS AT 50° F.

Package	Homogenized Whole Milk			Vitamin and Mineral Fortified Whole Milk			Vitamins A and D Fortified Skim Milk			Multivitamin Fortified Skim Milk		
	0 days	3 days	10 days	0 days	3 days	10 days	0 days	3 days	10 days	0 days	3 days	10 days
Clear Glass	39	33	33	38.5	33	33	38.5	33	33	38.5	37	33
Brown Glass	39	34.5	34	38.5	37	34	38.5	34	33	38.5	37.5	33
Waxed Paper Carton	39	35	34	38.5	33	33	38.5	36	33	38.5	37	33
Foil Laminated Carton	39	38	38	38.5	38	38	38.5	38	37	38.5	37	37.5

Watch Reynolds new TV shows "Walt Disney Presents" and "All Star Golf" every week on ABC-TV.

© 1959 by Reynolds Metals Company

For What Else Is an Advertisement?

Tell an editor that you read his magazine only for the advertising and you belittle him. Tell the same editor that you hang on his every word but skip hurriedly through the ads and you belittle yourself.

The editorial pages and the advertising both are reliable sources of information and ideas. The latter supplements the former in keeping you abreast of new developments. It serves a very special function, too. It tells you who makes what—when you need it to solve a current problem. The ads also spark ideas for the betterment of production efficiency, product quality, and packages.

They get many valuable facts and ideas

Here are some interesting examples—comments right out of a recent research report on FE readership:

"We've been having trouble with motors burning out from dampness. This looks like the motor we need. It's unaffected by moisture."

"Here's a refractometer that not only will cut time in analytical work, but will enable us to run a sugar test that we can't make now."

"That plastic belt is easily cleaned, and it won't absorb odors."

"We put a man into the tank to clean it, but he is so cramped he can't do a good job. This cleaner and spray are much more practical."

"Here's a check-weigher that will eliminate human errors and give better weight control of our finished product."

"When you boil everything down, you're only selling flavor, and here's a product that makes flavor tempting to consumers."

"Our trouble is seat trouble. We get seeping. I'm looking for a better valve. This could be the one."

"Nice packaging helps sell merchandise. This ad gives me an idea."

"That pump will handle semi-solids, such as our scrapple."

"Fat congeals in our lines. This air control should blow it out."

"After reading this ad, I know what specifications to look for when we get boxes."

"With that cooling method we could pasteurize beer in bulk and save a step."

"We never have tried this chlorinated water, but it cuts slime and we are interested in it."

Advertised products solve problems

Obviously there's pay dirt for readers in advertisements. And while no editor in our shop is directly concerned with the ads, we are aware of the extent to which those pages enhance the informational value of our publication.

Forty percent of our readers, for example, found something interesting in a single can company advertisement.

The vital role played by advertising in our national economy surprises people not engaged in selling. But the truth is that efficient mass production and distribution are possible only because of mass advertising. Nowhere is this more evident than in the food field.

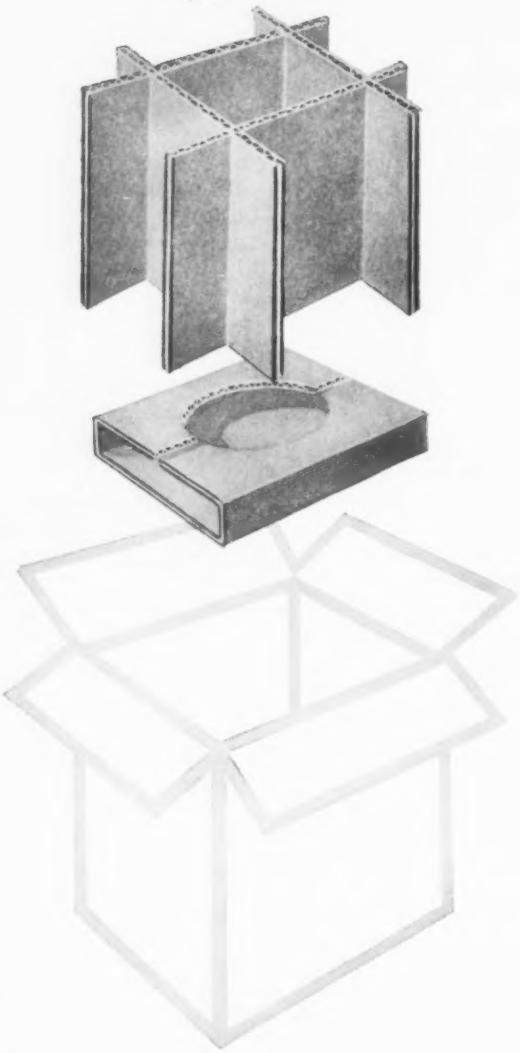
Technical genius in product development and manufacturing would be of no avail, except to fill warehouses, were it not for advertising. You can't make it if you can't sell it. And you can't sell it if it doesn't fill a want.

The ads tell you what want it fills—which of your problems it will solve.

For what else is an advertisement?

What you should know about

Does your corrugated box



For most products, proper interior packing is one of the most important factors in corrugated container design. Through its careful selection you can often prevent a costly chain reaction of damage claims and rejected shipments.

How much and which types to use will depend primarily on your product, its construction, how it is normally handled and shipped as well as the type of protection needed. You may find, for example, that *anchoring* the contents is paramount. Some packing pieces are made expressly for this purpose. Others *cushion* against impact and vibration. Still others are used to *separate* packed units. A fourth groups primary job is to *suspend* the contents within the container.

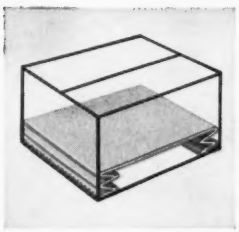
The forms of interior packing are as versatile as the items they protect. A few of the most widely and successfully used types are described here:

SPRING PADS

Like innersprings, these accordion-shaped pads help dissipate and cushion shock. Their buffer action absorbs vibration

interior packing for Union Boxes.

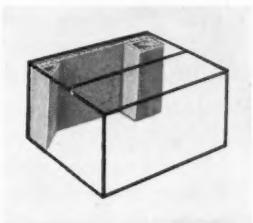
need an "innerspring mattress"?



which can cause loosening of parts and actual breakage — particularly where it coincides with the natural frequency of the packaged product and sets up harmonic resonance.

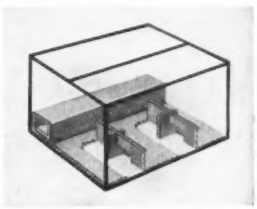
CORNER PIECES

These units "round off" the corners of the box's interior—provide extra protection at these vulnerable points. They cushion against crushing caused by improperstacking and impact resulting from humping or switching of freight cars, throwing, dropping and other shipping hazards that might squeeze or otherwise damage the contents.



DIE CUT SHEETS

Die cut inner packing comes in an almost limitless range of shapes, sizes, thicknesses. It can be made to perform practically any protective function. The pieces nearly always are tailored around the product—usually a fragile article, an item of irregular shape or one of unbalanced construction. Die cut inner packing is being used increasingly today because of the wide variety of items now shipped in corrugated containers.



Interior safeguards recommended or developed by Union-Camp are saving many companies thousands of dollars annually in packaging costs. Not to mention untold dollars that have been saved through the elimination of shipping damage. Whatever your product, your Union Box representative will be glad to work with you in determining the most efficient and economical approach to your particular packaging operation.

Write for free, informative booklet "Interior Packing of Corrugated Boxes"

union camp

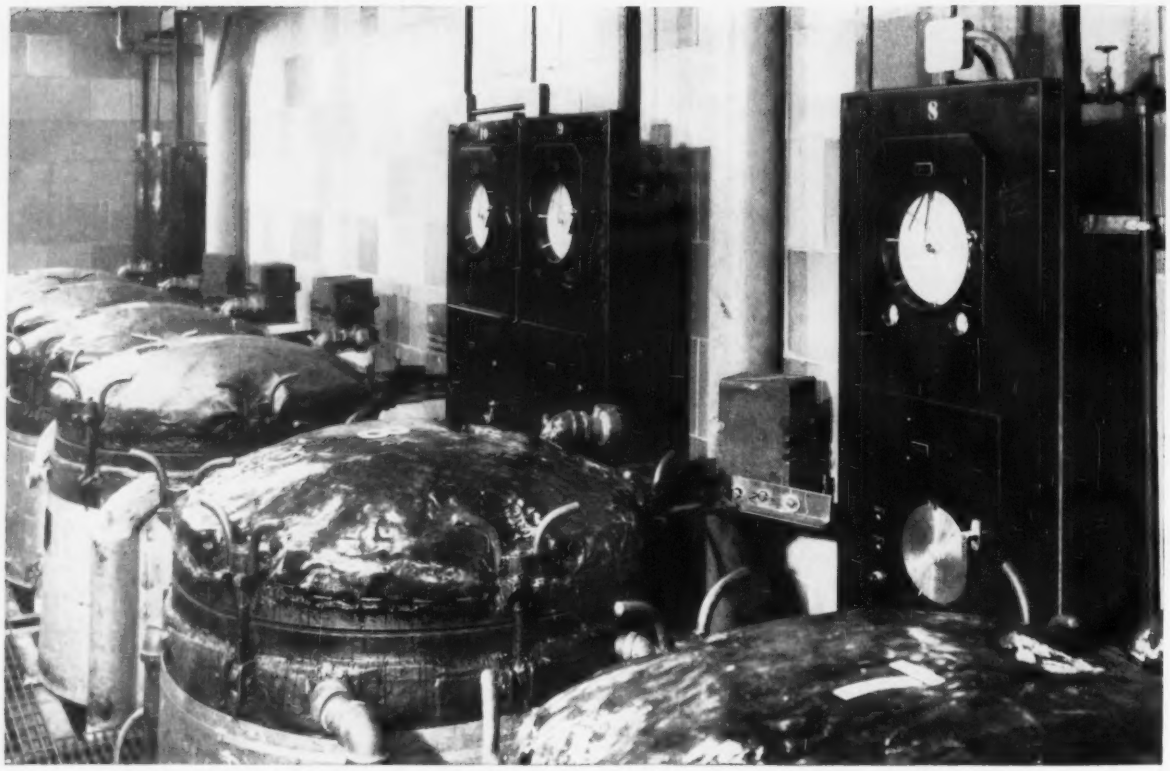
UNION BOXES

UNION BAG-CAMP PAPER Corporation
233 BROADWAY, NEW YORK 7, N. Y.

Factories: *Savannah, Ga.; Trenton, N.J.; Chicago, Ill.; Lakeland, Fla.*

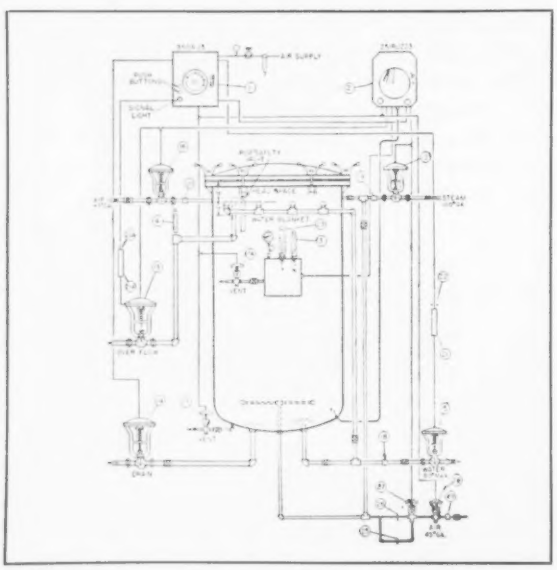
Sales Offices: *Eastern Division—1400 E. State Street, Trenton, N.J.*
Southern Division—P.O. Box 570, Savannah, Ga.; P.O. Box 454, Lakeland, Fla.
Western Division—4545 W. Palmer, Chicago, Ill.

For more data, circle 267 on Reader Service Card



Now! Fully Automatic COOKING CONTROLS!

The Taylor SWP7AV Retort System pictured above gives completely automatic control for either steam or water cooking, with or without pressure cooling. Can be changed from one to another in minutes. This efficiency in your processing controls can pay off handsomely in cutting waste, and protecting product quality.



This is just one example of Taylor control systems designed for the food processing industries. Taylor also engineers systems for **Scalding Tanks, Hot Water Systems, Washers, Ovens, Chill Rooms, Meat Cutters, Jourdan Cookers, Coolers, Blanchers, Open Cookers, Deaerators, Dryers, Evaporators, Quality Graders, Heat Exchangers, and Smokehouses.**

Ask your Taylor Engineer to tell you how Taylor control systems can help you cut costs. Or write for **Catalog 500MP** (for the Meat Packing Industry), or **Calatog 500** (for the Fruit and Vegetable Canning industry).

Taylor Instrument Companies, Rochester, N. Y., and Toronto, Ontario.

Taylor Instruments
MEAN ACCURACY FIRST

For more data, circle 268 on Reader Service Card

For more data, circle 269 on Reader Service Card→

RESEARCH
OF DEPTH AND IMAGINATION

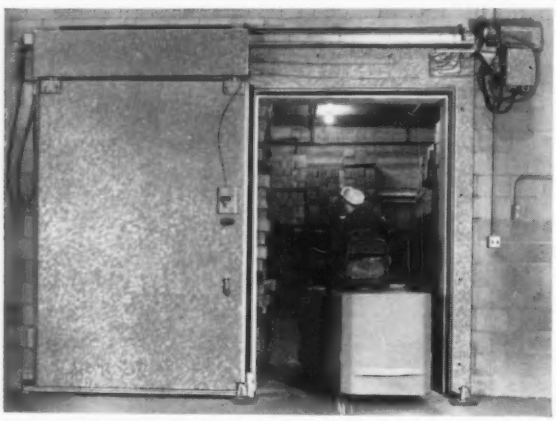
Working in the favorable atmosphere of pure research and practical application, Firmenich has made imaginative and substantial contributions to the field of flavor. By isolation, identification and synthetization, precise and potent flavors, possessing all the desirable organoleptic qualities of the originals, have been achieved. By new and exclusive techniques, these materials are now also available in powder form to give further application in flavoring. The depth of Firmenich research is evidenced in the award of the Nobel Prize and four medals administered by the American Chemical Society. The originality of Firmenich research has been shared with fellow scientists in more than 300 technical papers. Firmenich technicians are highly qualified to assist you in the use of Firmenich flavors in developing new products, in giving fresh appeal to those long established.

FIRMENICH INCORPORATED

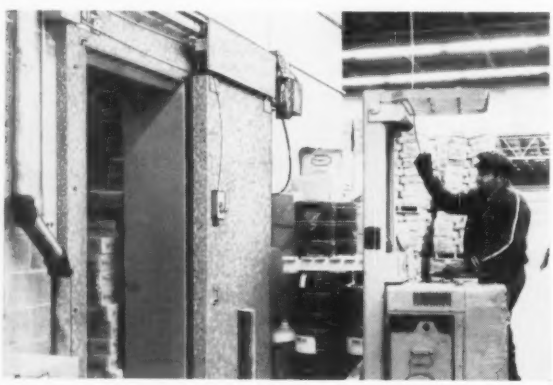
250 WEST 18TH STREET, NEW YORK 11
FIRMENICH OF CANADA, LIMITED,
348 WALLACE AVENUE, TORONTO
CHICAGO OFFICE: 612 NORTH MICHIGAN AVENUE
LOS ANGELES, 1756 MALCOLM AVENUE
GENEVA PARIS LONDON

LOEBEL

FAST, AUTOMATIC OPENING and closing speeds all cold storage room traffic



SAVES REFRIGERATION. *Electroglide eliminates costly loss of refrigeration with fast opening and closing.*



CONVENIENT, SIMPLE OPERATION *saves time and effort for personnel, increases plant efficiency.*

Jamison *ELECTROGLIDE** features save time and labor... speed warehouse operations

• Jamison's new Electroglide Door is now in operation in a wide variety of installations throughout the country and is proving in actual service that it will deliver extra savings and economy:

Low Maintenance

Level ride—no gasket drag • No shock closure • Reduction gear enclosed, sealed in oil • Frostop prevents icing, saves gaskets

Safe Operation

Full height safety door edge, sensitive full travel of door • Rear emergency release • Emergency controls for manual operation

Greater Economy

Minimum loss of refrigeration • Camlok compression seal for positive gasket contact • Faster operation, increased volume

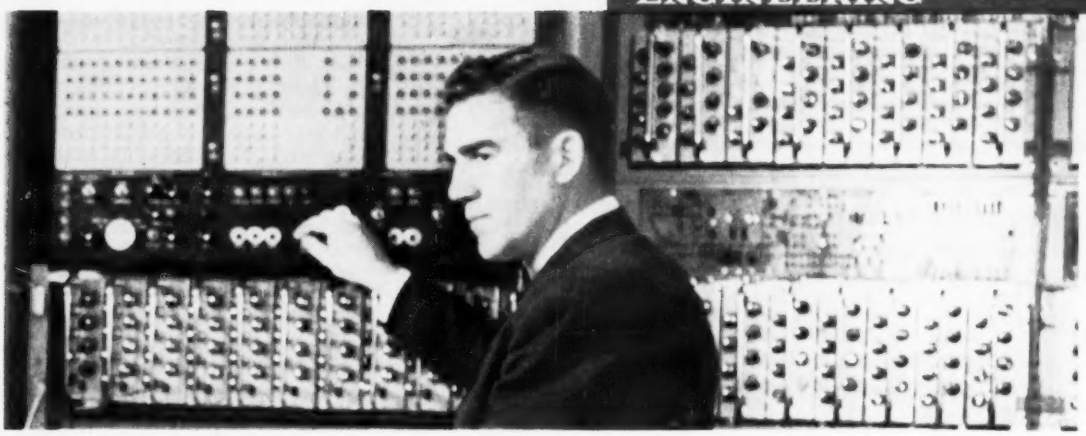
See for yourself how Electroglide can increase the efficiency of your own operations. Write today for interesting booklet to Jamison Cold Storage Door Co., Hagerstown, Md.

*Jamison trademark

JAMISON

COLD STORAGE DOORS

FOOD ENGINEERING
FOR MANAGEMENT IN MANUFACTURING, PACKAGING, MARKETING



From Purdue's 'electronic brain' (seen at panel is Author French) come pointed perspectives on—

How to Pick Your Product Line

To avoid pitfalls in making choices, you must spot all the factors and give them proper weight. Here, the tactics are clarified by experts—who made sure of their facts with an 'electronic brain'

LIFE BLOOD of a good business is a good line of products. But just *what is* a good line of products?

Recent research here at Purdue University, using our "electronic brain" to work the data, has given new insight into this No. 1 management question.

The points uncovered are generally applicable to product selection in any food-processing branch. However, our actual attack related to the problem in fluid milk plants, and this provides us with a specific illustration.

The "brain" was called in because of the immense size and complexity of the problem in the dairy field. Managers and salesmen have been arguing "paper vs. glass" for several years. Boards of directors have argued "wholesale vs. retail." This says nothing of the sweat and profanity attending decisions to place low-fat milk, eggs, orange drinks—yes, and even margarine—on milk trucks.

We were going to use the "brain" to answer these questions once and for all—but, we didn't. That is, we didn't exactly. For the "brain" said: "There is no *general* answer. Rather, there is a *specific* answer for each given plant, provided you appraise the right set of factors."

CHARLES E. FRENCH and ROBERT W. HOOD

Agriculture Economics Department, Purdue University, Lafayette, Ind.

We will discuss these factors in order to bring out the pertinent questions you should check in your own operation. But first, let us weigh the serious problems relating to our milk-business illustration:

How Many Products?

Some product lines, like Topsy, have "just growed". We recently queried our Indiana fluid milk plants—and found product lines ranging from 4 in one plant to 70 in another (see table on the next page). The average plant had 30 products.

Two decades ago it was different. In the intervening time we have gone from a simple quart-glass operation to a highly diversified, multi-product business. In this transition, half of our fluid milk plants went out of business—that is the real reason for searching out the factors.

This problem is a general one around the country. For example,

Bigger the Plant, More the Products
(Check of 107 Indiana Fluid-Milk Plants, 1957)

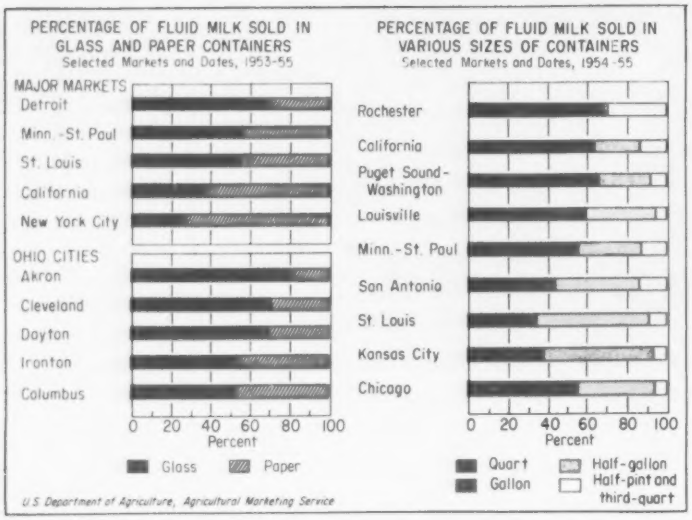
	Daily Intake of Plants						
	Over 100,000 lb.	50,000 to 99,999 lb.	20,000 to 49,999 lb.	10,000 to 19,999 lb.	5,000 to 9,999 lb.	Less Than 5,000 lb.	Average of All Plants
Number of plants	8	14	23	15	21	26	...
Average number of products	51	44	40	32	21	13	30
Range in number of products sold by different plants	24-67	27-70	14-70	19-50	12-33	4-18	4-70

WHICH CONTAINER? . . .

Choice Differs All Over Map

. . . AND WHICH SIZE?

Areas Show Wide Contrasts



recent USDA studies show wide geographic variation in percentage of milk going into paper containers (first chart). And there is the same wide variation in proportion of sales by different sizes of containers (second chart). These contrasting differences pose numerous questions, especially when we realize these data are averages and that product lines among individual plants vary even more.

In addition, new packages and products appear daily. Multiple-quart units have increased considerably. Foreign packages have come to the fore. The Tetra Pak from Sweden is making headlines, and The University of Reading in England has recently released some interesting material on polyethylene containers.

Low-fat content milk is increasing. Cottage cheese and ice cream are being added to fluid lines, especially to use surplus milk in seasonal production peaks. Grade A powder is entering traditionally fluid products. Special holiday products are often pushed. The other day we bought some frozen, chocolate-covered bananas on a stick. They carried a dairy label!

How to Decide

There are several ways by which problems of product and package selection are analyzed. Often the sales manager thinks it over, then tries what he thinks "might go." A bit more sophistication comes into it when we use cost accounting to budget out, on a unit-price/unit-cost basis, the profitability of each product. Often, wide-awake managers use break-even charts to help put these pieces together.

Our research has demonstrated that an "electronic brain" can handle such problems after you put them into mathematics. Regardless, of your system of analysis, evaluation of six pertinent factors is very important in determining your most profitable product line. You should—

1. Sketch Your Feasible Alternatives. The old adage, "diversify only so far as you can specialize", is sage advice. There are some products which are outside your realm of possibilities. Don't circumscribe your opportunities too narrowly, but be discriminating in a sensible way.

Volume of operation is in point. In our Indiana check, average number of products sold decreased with smaller plants (table p. 37). Let us check this factor of "sketching feasible alternatives" with the small plant and the introduction of the paper carton in the milk business:

Originally designed and accepted as a wholesale product, the paper carton has been relatively slow to receive acceptance at retail. Small plants have traditionally sold at retail. However, the high fixed costs of a traditional paper operation had to be spread over a large volume.

Small operators had several alternatives. They could (A) buy a paper filler, and attempt to achieve the necessary cost-covering volume. (B) Have their paper products packaged by a larger plant. (C) Continue with glass products, using aggressive selling and improved techniques to hold sales. (D) Have half-gallons packaged by some one else so they could hold their most demanding wholesale accounts and bottle the rest. (E) Put in multiple quart glass units and try to compete on quantity pricing. (F) Exert pressure for development of a smaller paper machine. The smart managers would weigh the most feasible of these alternatives before making a product-line decision.

Ideas are available from many sources—from industry publications such as this, from salesmen who approach you, and from your competitors. Go visiting and catalog your experiences. Find out what your university researchers and your competitors are thinking. Listen to both your production manager and sales manager.

2. Take Inventory of Your Plant Facilities. You may have machine capacity which will allow rather wide shifts in product. But you can only go so far. Our experience suggests maintenance of considerable flexibility without drastic shifts in equipment.

Take a look at storage. Some products, such as milk in paper, take less space than others (as milk in glass). Storage room or truck space that is pushed to capacity can be a factor.

You may have a plant layout that tends to freeze your labor by departments. If so, you haven't the flexibility of layouts where the workers switch about on jobs.

Your union contract or the specialized training of your workers may help dictate product line.

Some items, as milk in paper, take much higher operating-capital outlays than others, as milk in glass. If you operate on a narrow capital budget, weigh this in your inventory.

Certain items require special raw materials. Are your operating conditions such that these are readily available—and in long-run dependable supply?

The point here is that you operate with a bundle of factors, mostly accumulated over time. All these operating conditions should be recognized and carefully inventoried.

3. Evaluate Your Market. Some firms can sell all they can produce of any products. Many firms, such as

fluid milk plants, cannot. Try to establish your true market for different products.

Competition is certainly an important factor. How many sales will you lose if you don't "meet" a new product? Can you actually compete with this product? That is, can you adapt your operation in such a way as to compete on a profitable basis?

Such factors as the reputation of your own product and the personal contact of your routemen are important.

Our research shows that you can go quite a ways in "meeting competition", especially on small specialty items. Many fluid operators have "met the gallon jug with the gallon jug"—probably rightly so. It may have saved their share of the market. But don't jump too fast—for adding a product about which you know very little can give you headaches and losses.

Some products merely sap business away from your other products. Others may actually stimulate sales in another line.

So know the interrelationships among your products. Analyze your past sales records. Discuss customer reaction to specific items. Check the sales statistics in public reports and trade associations bulletins. Be careful of shifts in sales emphasis stemming from whims voiced in red-hot sales meetings.

Know your sales promotion program. We've found widely varying emphasis and results among such plans. Some products will stand promotion much better than others. Is your program one of promoting company name—or individual products? This is an important factor.

Are your routes sufficiently flexible to permit your salesmen to sell a new product? Promotion takes time. If the product requires considerable pushing, attention to your current route loads is advisable—*before* the product is added.

Put your market evaluation in perspective. Do you have sufficient capital to push the product through to full consumer acceptance? Too many products have been doomed because of inability to last through the initial, uncertain promotion stages. Are your plant men close enough to the product to avoid substantial training costs? Consider all such related factors.

4. Know Your Price Structure. Do you set prices? Or does some one else? On each specific product, you have these three basic relationships to consider: Your price for it (A) relative to your cost, (B) relative to your competitor's price, and (C) relative to your other products.

It's nice to talk in such *cliches* as, "Prices are set by competition" or "Prices dictate to us, not us to them". But be realistic and take a cold inventory.

Of course, you may not have direct control, but what happens if you alter your price relationship between wholesale and retail? Do your competitors do the same thing, or will you touch off a price war?

Do you have a systematic way to decide on store and home delivery differentials? Has the picture changed recently? What about paper and glass price relationships, or coffee cream vs. half-and-half? How did your market establish the price of low-fat fluid milk when it first came in?

These questions have answers which you must know.

Are you on top of the actual prices your salesmen proffer? Do you budget from a sales sheet giving actual unit prices including discounts, or do you use a price list that is more a guide than a directive to your salesman? To hide your prices under a bushel is not only naive but also costly.

5. Consider Your Raw Material Situation. Good industrial engineering and economics always caution that a change in product should be considered only in light of a change in raw material—but how often we overlook this.

For example, does the product alleviate or increase your seasonal surplus problem? Do you have an outlet for surplus items? Can you procure milk other than from your own producers? Is it more profitable to sell specific milk in product form—an added item in your line—or to sell it as surplus milk, skim, or cream? Careful budgeting of product costs and returns, compared with returns from bulk milk sales, will give you the answer.

However, don't take it for granted that selling milk through a new product is more profitable than selling surplus whole milk, skim, or cream. Here, a carefully set up budget may surprise you. For example, a low-fat product may leave substantial amounts of cream unused. Can you afford to sell this cream in product form? Availability of surplus cream outlets may be the deciding factor.

Many raw materials must be bought jointly, but the trend is for them to be available separately. Once plants took only milk and had to make the best use of both the fat and skim. This is not nearly as true now. Are you fully aware of your

THESE TWO PROJECTS WENT AWRY

—And So Teach Salient Lessons

▶ **1. New Product That Didn't Work Out as Planned:** There is about 2¢ difference in fat cost between a quart of low-fat (2%) milk and a quart of regular (3¼%) milk. And early in the introduction of low-fat milk, many operators gave a 1¢ differential and pocketed the other 1¢.

This was a good deal, since many of these sales appeared to be plus-sales anyway, so with such a nice spread things looked good.

However, it has now been shown that low-fat milk consumption is quite responsive to price changes and selling low-fat is a good way to gain entry into a market. With a wide differential between regular and low-fat, the latter will take sales away from regular milk.

Thus, some local operators who introduced this apparently lucrative new product in their markets have laid themselves open to an entry wedge from outside dealers.

Now, they cannot get their 2¢ back, have an increased surplus of butter fat to sell at discounted prices, and are sharing their markets with outside interests.

▶ **2. Platform Costs 'Proved It'—Then the Snag:** Inaccurate cost figures can lead to promotion of an uneconomical product. And getting *complete* costs is a must.

Recently, a plant manager gave considerable time to studies of two products relative to making a choice. And he felt himself 'all set' when his checkups indicated selection of Product A over Product B.

To prove his point, he showed us his platform costs, and they did make a good case for Product A. Also, these platform costs were, on the face of it, accurate.

But then we went further to check the percentage returns on each product—and it developed that Product A had returns of 13% of sales, whereas Product B had returns of only 1%.

It was noted that Product A was a carton item, while Product B was in a reusable glass container. With a large cost in containers, increased handling expenses, and only salvage value for the returned milk, Product A presented a much higher total cost.

This manager had overlooked part of his costs—a part that had appeared to him to be incidental, but which in this case tipped the balance in the other direction.—*C.E.F. & R.W.H.*

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alternatives in the raw-material area?

6. Know Your Costs. This probably sounds like a *cliche*. It is not. What will be the costs of adding a new product? In the case of the high fixed costs of adding paper products, can you get enough volume to spread the fixed costs? What will be the promotion costs of obtaining acceptance for a new product? What would be the effect of the same amount of promotion on your current product sales? How do the unit costs for a particular item stack up against those for products you are already running?

A. C. Hoffman of Kraft Foods, Inc., has said that spreading overhead costs is a primary reason that food processing firms add more products to their lines. Remember, though, that there is another side to the coin, which Mr. Hoffman recognized. Adding another item may be so costly as to cancel benefits.

Too many plants have no idea of the cost of producing a product. Although you shouldn't become top-heavy with cost-accounting techniques, some estimate of production and selling costs is essential to effective management. There is good reason why skilled accountants have become comptrollers. Today's product changes may come as a matter of a fraction of a cent per unit.

Know your own costs and what data your comptroller can give you on this type of question. Standardized cost systems assist chain organizations to make cost comparisons. Independent milk companies have also been able to develop good systems through such organizations as the Milk Industry Foundation, the International Assn. of Ice Cream Manufacturers, and the Edward B. McClain Accounting Co. These services can be quite valuable in the costing of product shifts.

Have you ever remarked of one of your products, "This item isn't paying us anything, but it's not much trouble to put up a few units every other day"? . . . Have you ever figured out how much change-over labor costs you in a year's time? . . . Have you asked your routeman if he didn't think he could convince Mrs. Jones that another product would do just as good a job for her, perhaps better? . . . Have you ever stopped to figure the load-out cost and delivery cost of a few units in the back of the truck?

Overall, is your product line as streamlined as your new pasteurizer? The consumer never sees your pasteurizer! —*End*

Free Uniforms Boost Morale

This, says Eastern baker, has in turn sparked higher production while also fostering top quality control

CRISP, NEAT women's uniforms (right) are whisked from Tasty's automatic press. Fast unit enables laundry worker to iron several hundred daily.

GIVE YOUR employees neatly laundered work uniforms, and what meets the eye is mightly attractive.

In truth, however, there can be a lot more in the way of advantages than thus meets the eye—particularly higher employee morale making for increased production.

This is cogently borne out at The Tasty Baking Co., Philadelphia, which makes and markets the Tastykake line of cakes and pies. Having furnished uniforms to its workers over 14 yr., the company's evaluations offer practical working points.

Spotlighting the angles and aspects is this revealing Q-&-A session with Clifton Brierley, Tasty's executive v.-p. in charge of production:

Question—First off, what would you say is the basic function of a free-uniform system?

Mr. Brierley—Sanitation is the obvious factor. But it has become clear to us that much more is involved. We now visualize our clothing routine as fundamentally integrated with quality control in our baking and packaging—also distribution, since our route salesmen are included.

Q—What about plant laundering versus use of an outside service?

Mr. B—At Tasty, we put in our own washing and ironing operation. Remember, we have more than 800 employees—meaning hundreds of pounds of wash daily. So we elected to handle it all ourselves, and thus control the whole routine. We set up a going operation staffed by competent personnel and adequately supervised by an experienced sanitarian.

Q—What role do supervisors play? And what is their reaction and that of the employees?

Mr. B.—Our supervisors have a prime part. If they note that employee uniforms are badly soiled or untidy, they can request complete changes of clothing. And since they are arms of management, we're especially interested in their reactions: They report that the clean, crisp uniforms are a great morale factor giving employees pride in their jobs and in their company. This is reflected in greater care in baking, packing and wrapping.

Q—How does the routine work?

Mr. B.—Each new employee is measured for a good fit. Then a card is issued for the laundry's records. The uniform is numbered, and that number is on file as long as the person is with us. Clothing is issued, piece by piece, on an exchange basis. Each male worker gets two shirts, two pairs of trousers, and a cap twice a week. In the summer, T-shirts are substituted for dress shirts. Similarly, women get wrap-around uniforms (photo) and caps. Aprons are issued as required—often several times a day.

Q—What is the total load?

Mr. B.—Approximately 12,000 lb. of laundry, including 8,000 hand towels, are washed at Tasty each week. A great number of the pieces are ironed before distribution.

Q—And what has it cost?

Mr. B.—Our expense of purchasing, laundering, ironing, and replacing work uniforms ran $45,000 in 1950 and jumped to $75,000 last year. From such outlays there must be tangible returns. And there are—in increased efficiency of personnel as reflected in their work. Our studies show our investment pays daily dividends.

Q—What do's and don'ts would you stress?

Mr. B.—Choose uniforms with a view to their simplicity for washing and ironing. . . . Make certain you maintain current clothing records for each worker, and that these are checked by competent personnel. . . If you intend to repair torn uniforms, employ skilled menders and put good mending equipment at their disposal. . . Be sure there is care in the operations to minimize possible damage to uniforms by rough machines or strong detergents. —*End*

Ole Sage Episode

How Can the Credit Union Help?

ED STRONG of Zenith Canning Co. launched the monthly luncheon discussion as the Guff & Gripers sipped their coffee: "You were going to tell us, Ole," he reminded, "about ways to avoid wage garnishments—besides forewarning the workers."

Ole responded: "First off, there'd be no such thing as wage garnishments if it weren't for workers making personal loans without ample security."

"Do you mean it all boils down to *that?*" queried Barney Hasbrook.

"Well," replied Ole, "let me put it this way: When we talk about personal loans, we're not talking peanuts. Last year, these loans and obligations totaled some $16 billion!"

"No wonder we have so many loan sharks and shysters!" Batt Bulwark exploded.

Continued Ole: "Some of the time-payment loans to cover purchases are made by merchants themselves, some by finance companies. But these are secured by the merchandise bought, and so aren't likely to result in garnishments. Personal finance companies account for another large chunk."

Bertram Barnastian, who'd instigated the garnishment discussion at the previous meeting, interjected: "Seems to me a bank's the best place to get a loan. Do you know any way I can induce my workers to try a bank first?"

"Fundamentally," said Ole thoughtfully, "it's the job of the banks to sell people on coming to them, if they—the banks—want the business. Christmas savings clubs have brought many small fry to banks for the first time. But, however desirable it may be, there's actually very little that managements can do to build employee-and-bank relationships."

"Still," exclaimed Bert wistfully, "there must be *some* way to prevent workers getting too deep in debt at impossible interest rates."

"Yes, there *is*," Ole confirmed. "And a very simple means, too. It's one that's helped solved financial problems of workers in thousands of organizations — I mean the employees' credit unions."

This brought a bellow from Batt. "Those are for the labor unions to run—not something for management to get mixed up with!"

"On the contrary," Ole disagreed, "anything that benefits employees is management's concern. And when something benefits *both* workers and management, as the credit union does, its value can't be questioned."

He went on: "Why, in the food industry alone there are more than a thousand credit unions. And it's my opinion that management helped most of them get started. And still helps them run smoothly."

"My bet," Batt belittled, "is that every one of 'em is in a big company."

"Well," said Ole, "I'm sorry I can't provide facts about the size of all the companies. But I do know that credit unions with as few as 50 members have been successful."

"As I understand it," spoke up Barney, "a credit union works like a bank. Right, Ole?"

"Yes, in general, it does," said Ole. "It accepts savings of members and pays interests on their accounts. It makes loans to members and charges interest on the loans—limited to 1% per month on the unpaid balance. Like a bank, the credit union can invest its surplus, and also can borrow, within limits prescribed by the laws under which it operates—either federal or state."

"So, how is it different from a bank?" Batt chided.

"The credit union lends *only* to members," Ole answered. "It accepts savings deposits *only* from members. Its earnings have a 6% ceiling, and only members participate. Membership is restricted to individuals with a common bond of occupation or association, or within a well-defined community."

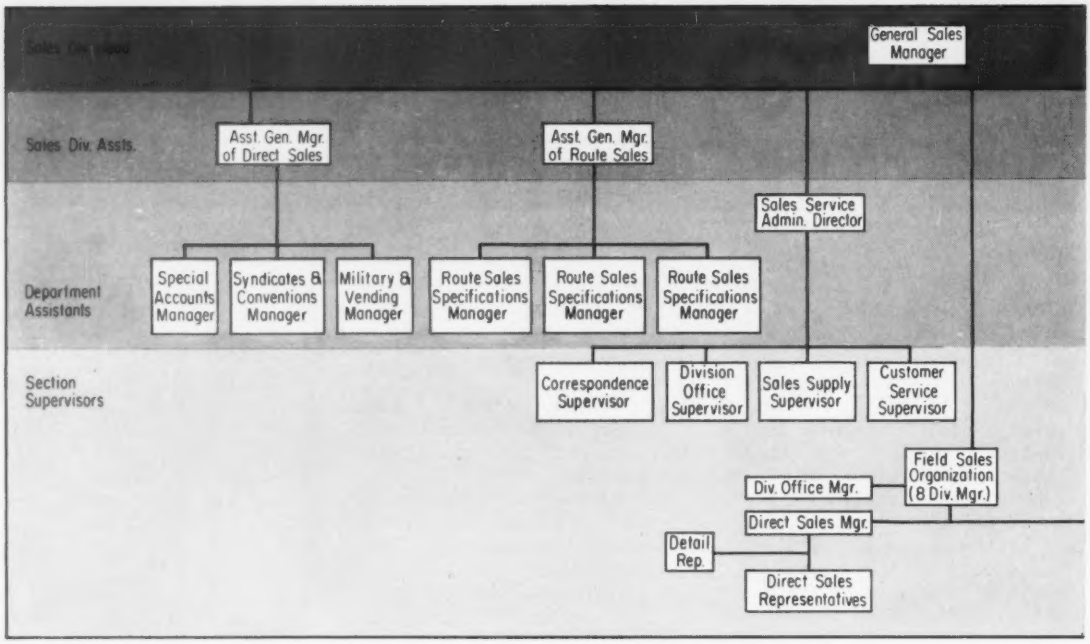
He emphasized: "Credit unions are operated *by* the members and *for* members. The total of more than 18,000 U. S. credit unions, with assets above $4 billion, are run by amateurs. Nevertheless, they have been surprisingly successful—failures are very rare. The credit union," Ole concluded, "is the best answer to minimizing employee financial troubles."

"There's a lot more I'd like to know about these credit unions," Ed Strong commented: "How do you start one? What role should management play? And just how does management benefit? . . . But here it is 2 o'clock. So I guess we'll have to wait until next meeting." —*End*

"We're not talking peanuts," said Ole. "Last year these personal loans and obligations totaled some $16 billion!"

IVAN C. MILLER
"Food Engineering"

Here's Curtiss Candy's



SALES DIVISION, one of five key operating groups, is run by general sales manager, who reports to sales v.-p. Areas of respon-

Shrewd Market Focusing Gets Sales

To keep pace with—and even ahead of—critical marketing shifts, alert candy maker transfers decision-making to field generals . . . New policy enables division heads to concentrate on day-to-day activities, headquarters on long-range planning

SO FAST is the tempo of today's food marketing that pace-setting firms must constantly check to make sure their selling methods are still up-to-date.

Take Curtiss Candy, Chicago. It overhauled its sales organization top to bottom when it found out that changed marketing conditions were blunting selling efforts.

The reorganization—which gave division managers more decision-making authority—received a full-dress trial in the Washington, D. C., area the greater part of last year. And results brought happy smiles to the company's top brass. Reason: while the firm, nationally, pushed sales up 7%, Division 2 tripled that performance with a hefty 22% jump in the Washington area.

Just how this alert candy maker was able to spot the trouble-source, correct it, and make the reorganization pay off with a strong sales gain holds important lessons for your operation.

As was the case of many other firms, Curtiss' problems began when rapid post-war growth swamped the central headquarters staff with decision-making work. As a result, field staffers had to contend with long delays before they could move to take advantage of competitive conditions.

To be in a better position to roll along with changes and future developments, the company sought a marketing setup that would: 1. Drastically shorten communication timespan between headquarters and sales divisions. 2. Clearly define areas of responsibility. 3. Spread know-how among more people. 4. Boost profits and clamp a lid on rising costs. 5. Gear packaging to spark impulse sales at the retail level.

Along with this 5-sided objective, the candy maker adopted a "let's-not-be-content attitude." Says President William C. Jakes: "Our own market surveys confirmed that Curtiss' products needed better 'selling up.' For 'insurance', we called in the management consulting firm of George Fry Assoc. to survey marketing, distribution, and consumer reactions. Their findings confirmed ours, crystallized our ideas."

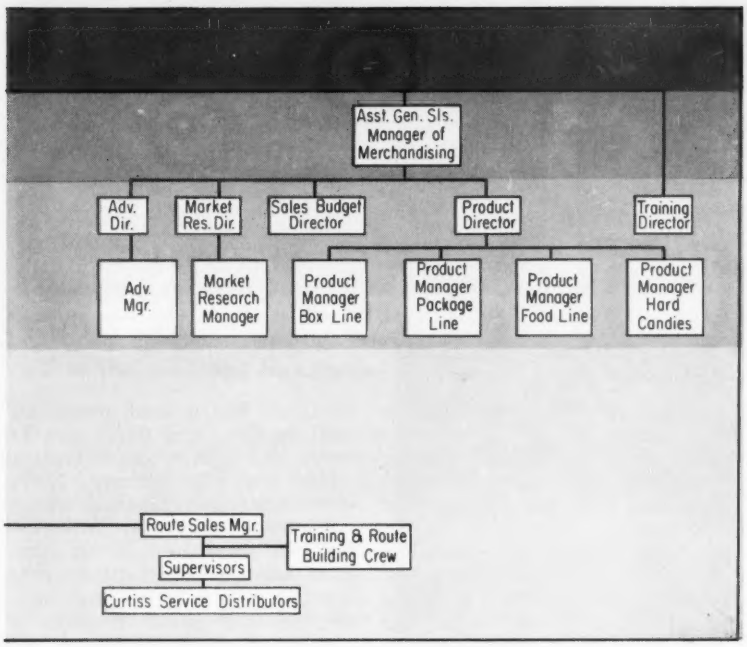
Consultant's Assignment

Fry's job was to unravel some knotty problems in the confectioner's two selling methods—truck route sales, and direct selling (chains, supermarkets, jobbers, and other large accounts). Sought was the proper combination of both selling techniques to assure greater flexibility and efficiency. Curtiss particularly wanted to make certain that its key front-line men were supplied with facts needed for a topnotch selling job.

The Fry group (consisting of Robert F. Dick, president; Roger E. Ball, vice-president, and staff consultants) proceeded to get intimately

JOHN V. ZIEMBA
Associate Editor, "Food Engineering"

Modernized Selling Setup



sibility are clearly staked out to boost operating efficiency, clarify work loads.

Strategy 'On Target'

acquainted with all phases of distribution through first-hand observations of sales practices and supervisory field operations. Further, it made a direct-contact survey of conditions, developments, and trends in the candy field. What's more it analyzed sales history and trends by product, geographic area, and channels of distribution.

Thus uncovered were these shortcomings:

1. **Too much centralization of authority and responsibility,** fostering unsound decisions on whether to sell by direct or truck-route method.
2. **Diminished enthusiasm by the field organization,** which didn't have sufficient authority to do an effective selling job.
3. **Inadequate selling aids,** even where field men had the responsibility to make decisions.
4. **Need for improved public relations** with the candy trade.

As a solution to this situation, Fry outlined this program:

- Revision in the organization plan, delegating new responsibility to field sales.
- Clear-cut assignment of responsibilities to both direct-sales and truck-sales personnel.
- Simplified, less expensive-to-maintain field (division) organization.
- Decentralization of certain essential record-keeping operations (basic sales records and performance), which were to be assigned to division office managers.
- System for analyzing distribution situations according to key markets so that proper choice could be made between the direct and truck-route methods.

Fast Start

Curtiss quickly moved to put the recommendations into effect.

The Div. 1 organization, with headquarters in Indianapolis, was selected to put the new sales control reports and records into operation, as well as to train, assist, and consult with division personnel.

At the same time, the company proceeded to develop a sales training program, studied headquarter's sales organization, assisted in working out a sale's potential analysis by division and throughout the country, established a compensation and incentive program for field organization, and evaluated strengths and weaknesses of sales personnel throughout the internal organization.

Specifically, attitudes of existing personnel were taken into consideration to "jigsaw-fit" them into the new organization. Certain of the district managers, for instance, had been more dedicated to direct selling, while others had been more devoted to truck-route methods.

After a 6-months' shakedown, the remaining seven divisions were ready for reorganizing. Here, Curtiss started off with a series of full-day conferences at the headquarters of each sales division.

Explained in detail at these internal information and planning sessions were such key points as nature of the new program, reasons for it, organization and objectives, and factors for effectiveness. Participating, in each case, were President Jakes, other top company officers, the division manager, and his staff. Further, each division conference was attended by direct sales representatives and truck-route supervisors from the field.

Under this new decentralized plan, division sales managers are charged with greater responsibilities for making on-the-spot field decisions. Too, lines of responsibility to field supervisors are simplified and shortened. By pinpointing authority, headquarters and field staffs are welded into a more efficient marketing team.

At the headquarter's level, performance was improved by regrouping and combining the company's former dozen smaller operating divisions into five—Sales, Production, Purchasing, Legal, and Finance & Administration, each headed by a vice-president.

Topside is the general sales manager—responsible overall for sales (promotion, advertising, market research, selling personnel, training, and working policies in the eight sales divisions).

Directly under him is the assistant sales manager for merchandising. This official coordinates product planning and package design, advertising, pricing, sales promotion, and market research.

Headquarter's sales staff now concentrates more on long-range market planning. It develops programs for specific products and consults with division managers in setting up marketing programs in line with a specific area's conditions. Often, promotional ideas stem from the divisions and are then worked out through headquarters.

Being a multi-product firm, Cur-

MORE LEEWAY is now exercised by the field division manager in planning marketing strategy and in maintaining . . .

CLOSE CONTACTS with retailers. Flexibility permits staffers to move faster against the competition.

tiss relies on product managers at the headquarter's level. Responsible to the assistant sales manager for merchandising, each PM has clear-cut duties pertaining to planning marketing and promotional activities in relation to a product.

Their Own Boss

Field division managers, under the new setup, plan their own areas, marketing strategy and sales programs, control costs, and target sales volume and profit. Operating within the framework of the company's general policies, they virtually run their own business. Assisting each division head are one office and two sales managers—direct selling and truck route.

"The new decentralized sales organization," President Jakes explains, "provides opportunity of growth for field sales personnel. This is in line with our basic policy of up-grading personnel according to merit.

Beauty of the new plan is that each division—more familiar with its own operations and problems—can now carry out its specific job more effectively. This specially recognizes the variable factors between divisions.

For example, market areas may widely differ. Seasonal buying periods in some regions like the south, open up ahead of others. They extend over a longer period, in some instances year 'round.

Mr. Jakes explains: "Curtiss sales have responded favorably to this aggressive marketing plan. Our entire organization has turned in creditable performances—both in increased sales efficiencies and in planned reductions in operating costs."

One especially fine performance was chalked up in Washington, D. C., where, a market development program was set in motion early in '58. With expanded distribution of the firm's Butterfinger bars as the goal, five campaigns—each one lasting two weeks—were staged in succession.

To stimulate consumer interest, heavy advertising support was rolled out. During the first 10 months of the year, reports a Curtiss spokesman, the company took 9,660 lines of space in Washington newspapers, compared with 1,553 lines scheduled by all other candy-bar makers. And on radio, 569 spot announcements were used in a 13-week period from March through mid-june.

The drive paid off in more ways than one. Most important, distribution of the Butterfinger bars was expanded from a pre-campaign 10% to an impressive 70%. And the firm's Baby Ruth bars and other products rang up increases, too, as the result of the momentum.

Long-Haul Gains

Company officials see the new policy paying off in long-range benefits, too. For example, a new recognition by retailers and vendors of the profit potential of sweets.

The Peoples Drug Stores group, which schedules ten special candy promotions a year, reports that "we sold out all our Curtiss 'trick or treat' merchandise long before our other brands." Chimes in G. B. Macke Corp., whose 125 trucks service 10,000 vending units: "We purchased 30% more Butterfingers than a year ago." And the four-store Jumbo Supermarkets chain adds that its sales of all Curtiss products nearly doubled last year.

As for Curtiss' direct and truck-route sales programs, flexibility is enhanced by tailoring of these distribution methods, based upon new careful "on-the-battle-line" analyses. Thus, type of selling used in a local market depends upon the method shown by study to be most effective in that area.

Vice-president for Sales Les Kellough says: "Truck-route selling works out best in small towns and rural markets. And direct sales to major chain organizations, or through jobbers and large accounts, proves more efficient in metropolitan areas."

Customer service plays an important role. Made available are sales-promotion materials that assist store operators to do a better merchandising job, and greater emphasis is placed on local advertising for stronger grass-roots support.

In addition to streamlining its marketing organizations, Curtiss has upgraded promotions.

Obvious Persuaders

How Curtiss creates a special holiday program can be seen from these tactics in its planning, packaging, and promoting:

Most store groups work on their major promotions 6 to 8 months in advance. Anticipating this, Curtis begins drafting its own campaign almost a year ahead.

Take last year's Halloween campaign as an example. Decisions were finalized on the new products and packing in the winter of '57. Of the 27 special items scheduled, 9 were newly packaged for greater appeal.

Important to retailers is the built-in convertibility of these packages. Mere removal of special tags from plastic bags or cellophane overwraps from boxes makes it possible for stores to integrate their holiday candy with the regular stock after the target day is over.

Strong annual advertising and promotion support sparks the success of the programs. Integrated with the advertising theme are vivid counter displays, banners, price signs and other point-of-purchase materials that quickly transform the store section into "Headquarters" for the cardinal day. Demand for last fall's Halloween displays resulted in nearly doubling the supply over the previous year. —*End*

"Our '*Follow-Up*' Put it Over!"

So says this enterprising operator who got maximum mileage from a radically changed package through astute exploitation—proving its all in the way you handle it

GETTING THE MOST from a new package design hinges on hard-hitting follow-through—much the same way the batter sends the ball on a longer ride by continuing his swing after his bat has met the horsehide.

For shrewd planning of post-change tactics prevents your new label from sidetracking customers who may look in vain for the older, more familiar package.

This was the problem faced by Purity Baking, Charleston, W. Va., when the licensed Donald Duck brand, which represented 70% of the firm's business, was retired by the Walt Disney organization from the bakery field. Reportedly the largest independent baker in its market area, Purity used the occasion to work up a completely new family design giving stronger identity to the company's 100-plus product varieties.

This target was met by (1) creating the "Purity Maid" trade character, (2) a 3-color band design keyed to product types, and (3) large-size lettering for the Purity name. But a big job remained in selling the new label to, first, the sales force, and, second, the consumer.

Here's how Purity's sales promotion department made the design changeover a jumping-off base for bigger sales.

To get employees fired up, the department worked through the monthly sales-meeting program, which was first set up in '54. These sessions are held in each of the firm's three production plants and three relay branches (used as warehousing points for redistribution of finished product to surrounding areas).

The sessions are supplemented with three special meetings a year—held at the home office—for general supervisors and sales managers. In addition, each plant has a supervisors' get-together every Saturday morning where operations of the past week are reviewed and objectives are set out for the week to come.

MERCHANDISING AIDS to promote package change include: (1) Window decal, (2) dummy loaves, (3) counter card, (4) streamer for store front, and (5) license plate replica for salesman's car.

SWEEPING USE of new brandmark is made throughout baker's business organization—on stationery, shipping cases, and trucks. Repetition of brand logo enhances recall value. Old design is seen on shipping case, top left.

What's said at each plant meeting is capsuled in a newsletter circulated to all plants so that each sales manager knows what the other five are doing.

Agenda for the sales meetings are drawn up in outline form by the sales promotion department. The plant and sales managers either add to or delete from the outline, or may even substitute new agenda they feel to be more pertinent to their needs at the moment.

Topic of each meeting is stressed in daily activities during the four weeks that follow. For example, after a session on "How to Get 'Em and Keep 'Em," salesmen will specially concentrate on finding new accounts and holding onto old ones.

While these meetings were run to alert the salesmen, the company made sweeping use of the new brandmark throughout the organization to make non-selling personnel aware of—and enthusiastic for—the changeover.

Letterheads, invoices, checks, neon

Outstanding Accuracy

PALMER

Dial Thermometer

Check these functional features

- Direct-drive Bourdon Coil with a filled system for longer lasting accuracy.
- Stem can be placed at any desired angle and case can be rotated to most readable position.
- External calibration for zero setting.
- Unaffected by stem alignment.
- Accurate to one scale division.
- No sticking at any temperature.
- Non-corrosive case.

PALMER

THERMOMETERS, INC.

Mfrs. of Industrial Laboratory, Recording and Dial Thermometers

2515 Norwood Ave., Cincinnati 12, O.

signs, shipping containers—all were redesigned to include the new Purity Maid symbol. And all trucks were repainted with 8-ft. decals that featured the head of the Purity Maid—with additional 5-ft. decals on the back of the vehicles and 3-ft. ones up front.

A week before the change became official, all of the firm's 200 sales personnel were brought to the Charleston office for a preview of the new package and the supporting advertising campaign. On hand was the professional designer who executed the new design, and he explained to the salesmen how the stronger family identity gave them a new merchandising tool.

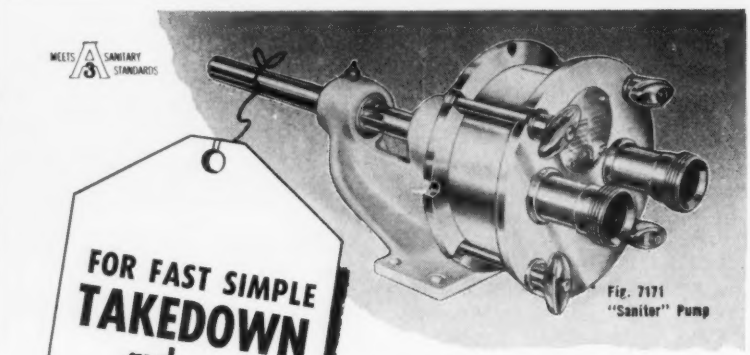
At the same time, the company secured from each salesman and supervisor a complete uniform. These were cleaned, pressed, and sewed with the new Purity insignia so that the men looked their best when they brought the newly designed product wraps into the store for the first time.

Next, the company turned its efforts to winning the all-important consumer vote at store shelves. A $250,000 advertising budget was scheduled for the remainder of the year, including a 100% increase in use of television, radio, and billboards. Newly created animated cartoon commercials were introduced on TV the day of the new label's appearance, and saturated the airwaves for weeks afterward.

To carry this support inside the store, Purity equipped each salesman with an unlimited supply of window streamers, decals, and counter aprons. Also, each man received dummy loaves made up with the new 3-color open-top bread wraps for window display in each store account. And to make each man's car a traveling billboard, there were replicas of the loaves for mounting on the vehicle's rear, and a miniature license plate depicting the new wrapper for use on the front end.

All of this precision planning paid off from the start. Sales surged 15% ahead during the first few weeks, then settled down to a better than 10% gain.

Sums up R. E. Nolan, sales promotion manager: "Our first objective was to satisfy our old customers. And our second was to attract new customers. We accomplished both objectives." —*FE Staff*



You can take down a Viking "Sanitor" pump quickly, without tools. Just four simple wing nuts to loosen by hand. Cleaning is easy, too. All surfaces are free from grooves, splines and threads in the pumping zone. One-piece, leakproof O-ring seal is easily removed for cleaning.

Made of solid dairy metal, the "Sanitor" meets 3A sanitary pump specifications and is noted for smooth, constant delivery of liquids without agitation or foaming.

For complete information, send today for illustrated catalog Section FE.

VIKING — The Leader not a follower in Rotary Pumps

VIKING PUMP COMPANY

Cedar Falls, Iowa, U.S.A. In Canada, It's "ROTO-KING" pumps

Offices and Distributors in Principal Cities—See Your Classified Telephone Directory

33-1/3% more capacity . . . 24" and 30" heights

in this new rectangular, mobile under-counter type

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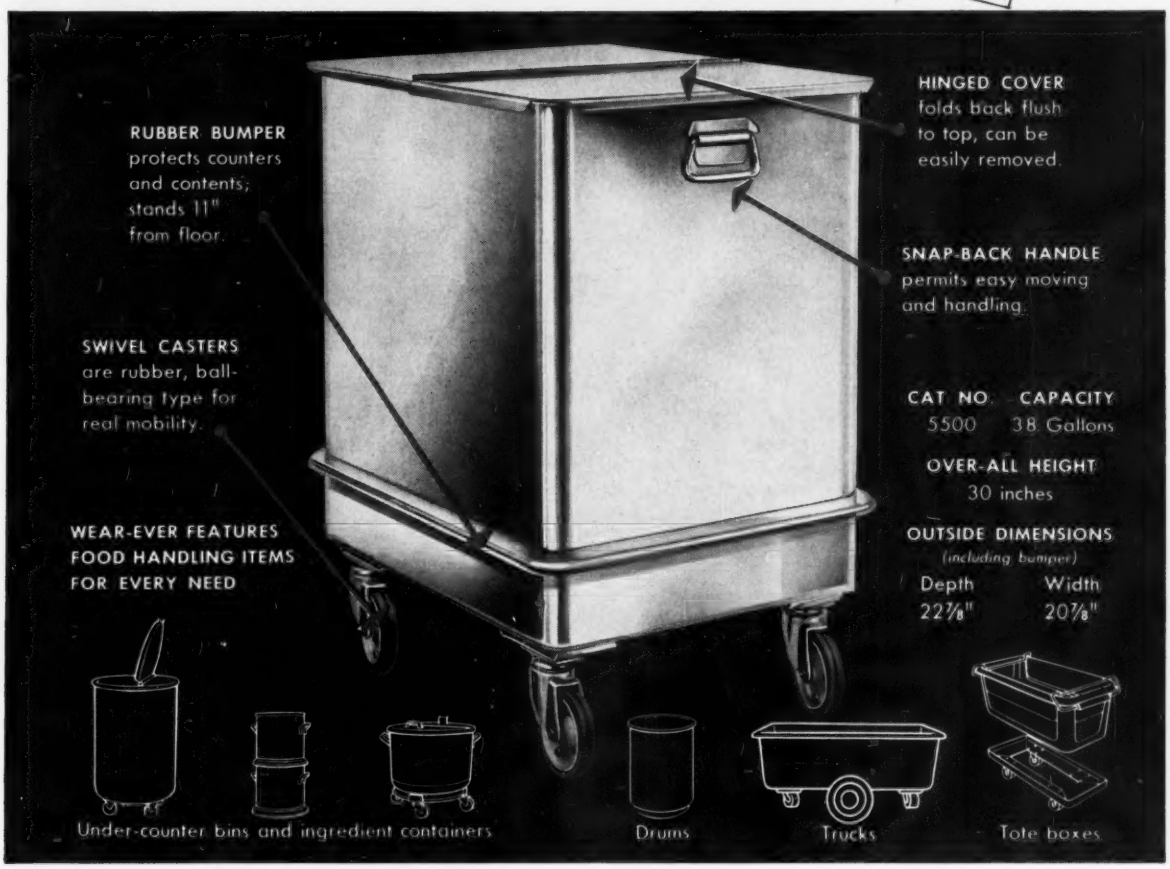
by WEAR·EVER

WEAR·EVER ALUMINUM TRADE MARK REG. U.S. PAT. OFF.



We've "squared away" the conventional round container, to give you ⅓ *more* carrying and storing capacity, *in comparable over-all size.* Think what this can mean to you in faster handling, fewer refills, greater utility.

Quality's the same, of course, as in all Wear-Ever Aluminum food handling items. Extra hard-wrought dent and scratch resistant alloy. Seamless construction. Smoothly rounded, easy-to-clean inside corners. Sanitary flared rim.

Naturally, we've designed this new container for a perfect fit under your standard cook's and baker's work tables —same as the round type.

Like to see a sample? Pick up the phone and ask your Wear-Ever man to wheel one over. Or send coupon for full details on our complete food handling line.

Ask us about our special equipment to your specifications.

WEAR·EVER ALUMINUM UTENSILS

WEAR-EVER ALUMINUM, INC.
WEAR-EVER BLDG., NEW KENSINGTON, PENNSYLVANIA

Wear-Ever Aluminum, Inc.
305 Wear-Ever Bldg., New Kensington, Pa.

GENTLEMEN: *I'd like to know more about your new rectangular under-counter bin.*

☐ Send me your catalog. ☐ Have your representative see me.

NAME .....

TITLE .....

Fill in, clip to your letterhead and mail today.

NEW ITEM! *Wear-Ever's new Metal Scouring Cloth. Won't scratch, won't mar, far outlasts ordinary scouring cloths. At your dealer's.*

B.F.Goodrich

Photo courtesy Farwest Fishermen, Inc., Anacortes, Wash

This belt cleans easily, resists oil, is easy on the eyes

B. F. Goodrich Highseal belt cuts maintenance costs, lasts longer

Problem: At the peak of the season, those women inspect up to 35,000 pounds of salmon an hour. An ordinary rubber belt was first used on this line, but fish oils soaked in, darkened the belt, left a fishy odor. No amount of cleaning could get out the smell, and the dark color made inspection difficult.

What was done: Then a B.F.Goodrich distributor recommended an improved conveyor belt, developed by B.F.Goodrich for handling foods where oil and grease is a problem. A special rubber compound gives the Highseal belt good resistance to most greases, fats and alkalies, moisture and food acids. It is light green in color, a shade selected by color experts as being easiest on the eyes for inspection service. It can take temperatures down to zero, up to 212 degrees.

Savings: After three seasons, the Highseal belt has not shown the slightest amount of wear. The plant engineer also reports that the new belt holds lacing better, so there's less down time and maintenance is no longer a problem. Employees who work over the green belt find their job easier, more pleasant.

Extra benefits: Since food can't grind into its smooth, polished surface, this belt can be wiped clean with a damp cloth—no scrubbing or scouring needed. And because it is odorless, tasteless, non-toxic, there's no danger of the belt contaminating food.

Where to buy: Your B.F.Goodrich distributor has full information on this belt and can tell you about its many other advantages for food-handling operations. *B.F.Goodrich Industrial Products Company, Department M-550, Akron 18, Ohio.*

B.F.Goodrich *conveyor belts*

For more data, circle 274 on Reader Service Card

CASE HISTORY OF MONTH

From files of *National Consumer Panel Division of Market Research Corp. of America.* Material is factually correct. Identities of product and companies have been masked to insure anonymity.—The Editors

Check Uncovers New Product Idea

Management's problem

THREE PACKAGE SIZES of a widely used specialty food product are marketed by our firm. In recent months, trade orders for the smallest size, though increasing, have shown a less favorable trend than our other sizes.

Our problem now is to find out why this has happened.

WHAT WOULD YOU DO?

Management's decision

We decided to take a hard look at the purchase records of families in the National Consumer Panel to see whether any elements of weakness could be located in the brand franchise of our smallest size. This analysis covered the last three 6-month periods and was designed to answer the following questions:

1. What is the trend in the *total number of families* buying our smallest size, and in the *rate* at which these families are buying it?
2. How much brand loyalty does this smallest size enjoy? What other brands, types, and package sizes are also purchased by people who buy this size?
3. Which brands did our "new" customers purchase previously, and which brands did our "old" customers buy when they switched from ours?
4. Is price a factor in the "customer turnover" on our smallest size?

Result of action

The findings showed there was no cause for alarm in the fact that orders for the smallest size had failed to increase as rapidly as the other sizes. The total number of families buying it was expanding, and the amount purchased per family was holding steady.

Price was definitely not a problem, because customers making their initial purchase of our brand had paid less for the brands they had bought previously. The biggest single competitor of our smallest unit was, in fact, our own medium-sized package.

Aside from reassuring us there was nothing basically "wrong," the study revealed a very promising area for new product development. It was found that buyers of our smallest package concentrated their purchases almost entirely on lightly-flavored versions of the product. Only a handful ever bought strongly-flavored varieties.

This overwhelming preference for mild flavor on the part of existing customers, coupled with the demonstrated loyalty to our line, clearly indicated that we should consider introducing a strongly-flavored variety as a companion item. Such a move would not materially affect present customers, and would probably enable us to expand our total franchise considerably.

For more information, write to Case-History Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y. Your inquiry will be directed to source of case-history item.

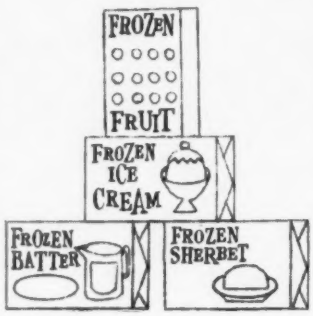
This Yarway team has scored high—over a million installed on all types of steam equipment. Stocked and sold by 270 Industrial Distributors. For free Steam Trap Book, write YARNALL-WARING CO., 127 Mermaid Ave., Philadelphia 18, Pa.

go YARWAY with confidence

Circle 275 on Reader Service Card

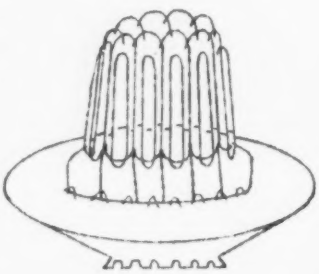
Which of these algin uses best solves your processing problems?

Thickening



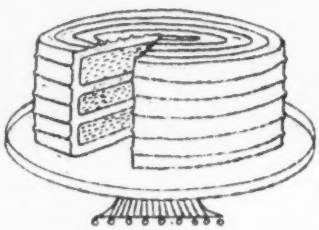
Stabilizing

Suspending



Gelling

Emulsifying



Coatings and Icings

Unique and effective hydrophilic colloids, Kelco Algin products speed production and cut costs. Further, they improve your product's eye and taste appeal. They provide proper body and texture, reduce settling or separation, retain moisture in place.

Easy to use and readily soluble in hot or cold water, Kelco Algin products are providing the answer to diverse processing and production problems in many fields. If you have a problem in thickening, stabilizing, emulsifying or gelling, please contact us. The Kelco Company's technical staff is at your service, ready to recommend the right algin to solve your specific problem. Call or write your nearest Kelco regional office.

Kelco Company

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Commerce Dept. Data 'Short Changing'

New Commerce Dept. figures which now measure food expenditures below previously reported levels are being criticized for presenting an incomplete picture. The lower concept came about when Commerce changed its basis for making projections.

Department statisticians formerly computed food expenditures as a projection of retail food store sales. But this failed to allow for the increasing importance of non-foods in the retail picture. Then, to compound its original error, the Department decided, when drawing up a new base, to eliminate: (1) Meals served in hospitals and other institutions, (2) food distributed free by Government agencies, (3) meals served by transportation firms for which no charge is levied, and (4) meals charged as business expense.

Charles W. Smith, McKinsey & Co., feels situations like this point up the need for business to take a more active interest in the Government's data gathering. And GMA's Robert Bingham argues that the new data omit elements that are important to the industry's market planning.

60% Expansion in Food Sales by '69

"Food sales to consumers should expand by over 60% within the next 10 years–from $72 billion in '58 to over $115 billion by '69–in order to keep up with potential expansion in our standard of living." So declared V.-P. Arno H. Johnson, J. Walter Thompson, at last month's National Canners meet in Chicago.

Population increase (from 174 million to 209 million) will account for 20% of the gain, he says. But, he stresses, the remaining two-thirds of the 60% potential uptrend must come "through changes in food habits–upgrading the diet, and increasing the quality, convenience, and range of selection of foods."

Patience–A Marketing Keynote

Don't expect overnight results from a switch to the new marketing concept. That advice is often stressed by experts who caution that marketing overhauls should be designed for the long pull.

A case in point is the experience of Ward Baking, which last year completed a realignment project that began in '57. Firm's new marketing program puts overall emphasis on product line, gives each product its own marketing group and advertising agency, and accelerates new product development. Result: while profits for the fiscal year ending Dec. 27 were off 18%, fourth quarter net surged 25% ahead of the '57 period.

Enticing Shopper to Buy More

End-aisle displays induce consumers to make extra purchases of canned foods, according to a recent USDA test in the Boston area. But labor costs vary with the type of display used–a point to bear in mind.

Jumbled basket setups were 25% more effective than pile-on displays, and were handled at a cost of 53¢/100 cans sold. Formal basket arrangements, 16% more effective than pile-ons, had a handling cost of 68¢/100 cans. Labor costs of the least effective pile-ons were $1.15/100 cans.

Beer: Big Get Bigger

Concentration trend in the brewery field showed no let-up in '58. Figures compiled by *Modern Brewery Age* indicate that the top ten brewers increased their aggregate sales 2.7%, while overall beer sales of 84,250,000 bbl. showed little change from '57. Significantly, though, the top ten expanded their share of overall sales from 46% to 48%.

Anheuser-Busch, which wrested first place from Schlitz in '57, strengthened its hold last year with a 14% increase, while its Milwaukee rival suffered a 2.2% decline. However, Schlitz recently moved to strengthen its position by adding a popular priced brand, a step others (such as A-B and Pabst) have already taken in an effort to penetrate additional markets.

BRIEFS

Product diversification at Continental Baking now divides firm's sales as follows: Bread, 67%; cakes, 23%; frozen foods, 7.5%; and snacks, 2.5%, says Francis I. duPont & Co.

Advance notice of planned promotions and allowances will be asked of food manufacturers by U. S. Wholesale Grocers' Assn. to "help combat discriminatory deals."

Higher prices of ready-to-eat cereals upped dollar sales 12%, while tonnage gained 5%, for marketing year ending Aug. 1, '58, reports Cereal Institute.

National brand image campaign helped William Underwood Co. to double sardine sales past two years, according to J. D. Wells, sales manager.

Merchandising of potato chips as staple, rather than snack, enabled product to boost sales 10% last year, topple peanuts from best seller class in sporting and amusement areas, says Potato Chip Institute.

Selling and advertising expenses for Sunkist's lemons in latest marketing year totaled 3.1% of sales dollar (vs 3.0% previous year). For oranges, it was 2.3% vs. 2.6%.

Sweets will be slanted to "outdoor living" theme in E. J. Brach & Sons spring promotion. Dozen new candies will be introduced during campaign.

Truckload of consumer premiums will tour shopping centers in four Middle Atlantic states to announce new type of cured bacon introduced by Esskay.

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FLEXIBLE • NON-TOXIC

ABRASION-RESISTANT

STERILIZABLE

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B44-3 Plastic Tubing

Tygon Tubing combines the best features of both rubber and glass with the disadvantages of neither. Clear, like glass, flexible, like rubber it is an ideal piping medium for handling liquid foods and beverages. Use it in long, continuous lengths, or in short sections to couple fixed piping to process units. Completely non-toxic, and non-contaminating to the most delicate foods. Available in 66 bore sizes from 1/16″ to 4″. Write for Bulletin T-97.

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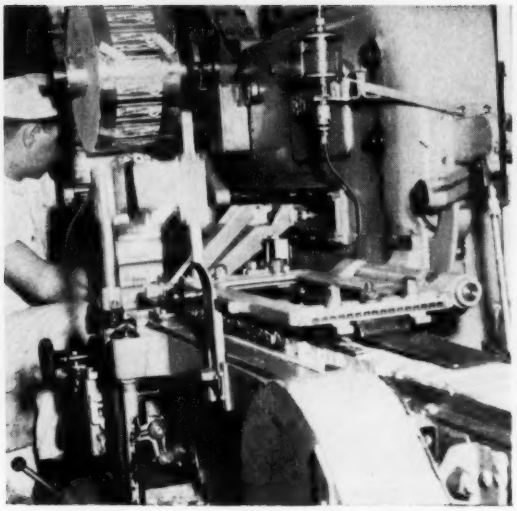
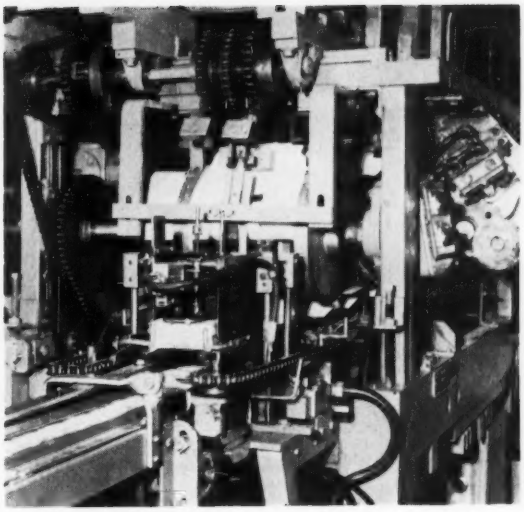


WRAPPER that operates with roll-stock of paper-laminated color-printed foil overwraps ice cream slices, which then move via conveyor to . . .



. . . **NEW MACHINE** that groups them for packing into self-locking, tamper-proof cartons. Speed: Up to 150 wrapped ice cream portions or pies per minute.

Mechanizes Multi-Unit Packing . . .

. . . with new multiple-function machine that accumulates portions for insertion in self-locking cartons that are automatically set up . . . Used here for ice cream, unit adapts for wide variety of other items

AN AUTOMATIC system that collates and packs individual ice cream portions into a 1-piece, self locking carton has now been put on-stream at our Dean Milk Co. plant in Belvidere, Ill.

Employed is a new multi-packager that promises to ease the manual costs that have been roadblocking multiple single-serve packaging projects.

While we are using the packager to handle 6-packs of our own "Quick Serve" slices, as well as the franchised Eskimo pies, the machine has a definite application for other products—such as candy bars, baked goods, frozen foods, dessert and cake mixes.

Our search for a mechanical method of packaging in multiples began when we introduced foil-laminated, paper-wrapped 3-oz. portions of Neapolitan-style ice cream. The item was promoted to both housewives and institutions as a multi-unit product supplementing standard pints, quarts, and half-gallons.

At that same time, we brought out a 6-pack of 3-oz. Eskimo pies in addition to our 1½-oz. Junior pies (available in a variety of flavorings and coatings).

Our pies and Quick Serves are interchangeably handled on the same processing-wrapping line. Consequently, installation of a machine to accumulate and pack the wrapped portions into cartons has resulted in substantial cost savings.

Heretofore, our operations had called for five packers—four to set up and carton pack wrapped portions (6's) and one to bag-pack cartons (12's).

How We Operate

Our solution to the automatic multi-unit packaging problem was the installation of the first production model Cluster-Wrap machine (Mead-Atlanta) that handles up to 150 wrapped ice cream portions or Eskimo pies per minute.

The new machine requires an operator who, in addition, runs the overwrap unit (Supermatic). However, we still employ a girl to bag the multi-packs—an operation that we soon hope to automate.

Step-By-Step Sequence

Ice Cream, piped from a 3-tube freezer (Cherry-Burrell) to a dual-head extrusion nozzle, is formed and cut into 1½- or 3-oz. portions by electrically heated wires. Slices drop onto stainless steel pallets (1,600 in all), equally spaced and mounted on a 670-ft. chain belt operated through a vari-speed drive (Reeves). Travel through a −35F. hardening tunnel takes 22 to 28 min.

Slices (Quick Serves) proceed directly to the wrapping machine. Pies, on the other hand, continue through enrober and chill tunnel (Greer), and then to the wrapper. Portions are machine-wrapped—without sealing—in paper-laminated color-printed foil (Reynolds) that is supplied in roll form.

The Cluster-Wrap unit operates

ROY HAIRE

Manager, Ice Cream Division, Dean Milk Co., Belvidere, Ill.

in this manner: Suction cups pick up and revolving feed bars peel off magazine-fed carton blanks one at a time. A top flap-tucker "breaks" the scored blank to form the flaps, which are held by metal guides as the carton is carried forward to product-insertion station.

At this point, a double chain-mounted pusher automatically inserts the accumulated portions, mechanically stacked in two layers of three 3-oz. bars each or one layer of six 1½-oz. bars. Bottom flap-tuckers wrap carton around stacked bars.

As package approaches final fold and locking station, carton tabs (3) are formed for insertion. Formed and locked—without gluing or stapling—multi-unit carton is discharged from machine by take-off conveyor for manual bagging.

Cartons (Mead-Atlanta) are of solid bleached sulfate construction, with a die-cut strap-style "window." Self-locking box comprises a perforated, tearback section at window.

The tight-wrapped carton is also tamper- and pilfer-proof—a feature that abolishes need of carton overwrapping, as with ¼-lb. margarine sticks packed four to a carton. Printing is off-set 4-color, by multi-screen process.

Soon to be available is a strong moisture-proof carton (for frozen foods), made of foil laminated to natural kraft.

OPENING IS EASY using perforated tear-back section at side of die-cut strap-style window. Self-locking carton is tamper- and pilfer-proof, needs no overwrap.

—*End*

COOLING CONVEYORS carry tortillas to this table, where they're hand packed. Ten of them go in each cast polyethylene bag.

Cast Polyethylene Film

This Texas specialty food maker gets a merchandising bonus of higher gloss and transparency. Further, package breakage is greatly reduced.

DECIDED VALUE to be gained with an advanced film has been speedily recognized by an enterprising Texas specialty food maker—El Popo Tortilla Factory, Inc. of San Antonio.

This concern got one of the first looks at the new cast film made from Petrothene polyethylene—and quickly found it "just right for the wrapping."

What sold El Popo was the film's strength, soft feel, and moisture-and-chemical resistance, combined with high transparency and gloss—and all at a cost saving.

The San Antonio company now uses it exclusively in packaging its tortillas. It is, further, a "natural" for overwrapping other baked goods as well as tea, candy, frozen foods, and dairy products.

One of the largest makers of Mexican specialty foods, El Popo distributes both in San Antonio and a wide surrounding area. Fresh tortillas sold in stores bring 60% of the sales. And accounting for the remaining 40% are packaged tortillas that are shelf-displayed or freezer-stored.

Films Boosts Sales

With the company's initial adoption of conventional polyethylene for packaging a few years ago, a 20% boost in sales volume was realized. This new film is expected to jump the volume even more.

Packed in the film bags, tortillas will remain fresh for four days on store shelves—longer in freezers. This is in sharp contrast to the old waxed paper bags which afforded merely overnight protection. And the cast polyethylene also offers several advantages over other films that were tried by El Popo: There is less breakage in transit and in the stores, and the price is 15% lower. Also, the new film goes further per pound: a pound of 1 mil cast polyethylene film covers about 30,000 square in. as compared to only 20,000 for conventional cellophane.

At El Popo nine automatic ovens (2 stand-by) feed tortillas to two cooling-conveyor lines. The masa

NEXT, FILLED BAGS move by conveyor to automatic sealer, where they're closed at 60 a minute.

TAMALES are also made at El Popo. Packaging is the same as for the tortillas.

Improves Package, Cuts Costs

(dough) is fed into the ovens, where it is automatically baked and discharged onto the cooling conveyors. At the end of the conveyors, the tortillas are stacked and counted by hand, then are packaged ten to a bag.

Next, the bags are placed on smaller conveyors feeding a Pack-Rite automatic sealer. Here they are sealed at 60 a minute. Since the cast film bags don't shrink or shrivel when heated, they make a neat and attractive package.

El Popo also manufactures tamales. As these come out of the forming machine, workers wrap them in bleached corn husks, then place them in a tray which goes into the cooking ovens. After cooking and cooling, the tamales are packaged in cast polyethylene film bags, sealed and shipped.

Introduced at Exposition

Pioneered by U. S. Industrial Chemical Co., a division of National Distillers & Chemical Corp., Petrothene cast polyethylene film was first introduced at the National Packaging Exposition last Spring. It is now being produced by several extruders. Among these are Texas Plastics Co. (supplier for El Popo), Ludlow Papers, Inc., Continental Can Co., and Cee Jay Extruders, Inc.

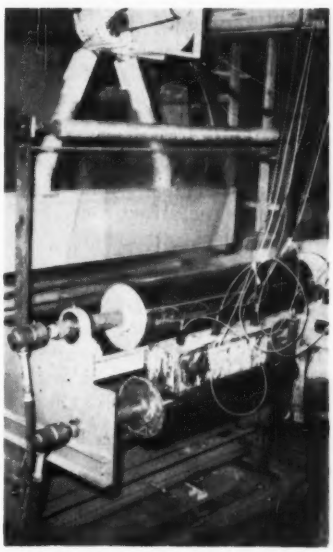
At Texas Plastics, the film is extruded onto highly polished, chrome-plated, chilled rolls. This method of forming the film imparts the unusually high gloss and excellent transparency that are important merchandising advantages.

The film winds around one roll and then a second, bringing both sides of the film in contact with the rolls.

1,000,000 Bags Daily

Texas Plastics can produce 1 million printed polyethylene bags daily. In 4-color presswork, speeds up to 500 fpm. can be obtained. A project is now underway to increase printing speeds by overcoming the registration problem that results from the stretching of the film.

The Texas supplier starts with the raw material in pellet form, converting it into film of various thickness. It then treats the film for multicolor printing and fabricates the bags to specifications.



EXTRUSION onto chilled rolls is the key to cast film's high gloss and transparency. Seen is operation at Texas Plastics Co.

Creating The Package

How bundling with AVISCO® cellophane can improve distribution of your product and save you money

The bundling of anywhere from 3 to 24 packages of a kind is common practice with manufacturers. It divides the contents of their shipping cartons into easier-to-handle units, and protects their products during distribution and shelf storage.

Traditionally, a printed paper wrap or box has been used for this purpose. But today, economy-wise, sales-minded manufacturers are using AVISCO cellophane. Here's why:

Bundling with AVISCO cellophane offers substantial savings. It eliminates the need for printed or labeled boxes and paper overwraps; operates faster and more efficiently on wrapping machines; seals easily, quickly and securely with heat, thus ending the gluing operation.

New packaging flexibility over boxes is also achieved because bundle sizes can be changed simply by adjusting the machines. Even more, the use of cellophane reduces shipping carton sizes, shipping weights and the amount of warehouse space needed to store packaging materials.

Cellophane bundling also wins favor with wholesalers. It enables them to make up orders easier because its true transparency permits 6-sided visibility. This means instant identification and faster count. Cellophane also gives complete protection against dust and moisture—and seals in freshness. So, you see, it actually becomes an extra selling tool.

Retailers also profit from cellophane bundling. Identification and handling are easier. Bundles can be used as shelf displays without unwrapping—thus assuring fresh, clean stock. And the sparkle of cellophane adds dramatic sales appeal to the products! Another advantage retailers like is the elimination of the disposal problem caused by bulky cartons and wraps.

If you have a product that's bundled (or should be bundled), tell us about it. We offer a complete packaging service to assist you, and demonstrate how AVISCO cellophane, plain or printed, will answer your bundling requirements better and more economically than any other packaging material. Phone or write us for an appointment with our representative in your area or a selected cellophane converter specializing in your field.

AVISCO®

AMERICAN VISCOSE CORPORATION, FILM DIVISION, 1617 PENNSYLVANIA BOULEVARD, PHILADELPHIA 3, PENNSYLVANIA

Spotlight on Packaging "Don'ts"

Merchandisers and consumers sound off on pet peeves . . . Comments make up handy check-list of what you should shun

THE SMART food packer pays keen attention to what others—especially retailers and housewives—say about his package.

For, if the former don't like it, they won't re-stock, and the latter will leave it on the shelf!

A recent symposium sponsored by the Food Packaging Council, in Chicago, put the spotlight on the sharpest packaging complaints. If your container isn't guilty of any of the faults noted below, chances are it will be a winner.

Your package, according to Howard Rasmussen, vice-president, Jewel Tea, plays a key role in braking rising handling costs. He figures that's because the typical package gets 27 handlings from the delivery truck, back of the store, to the point of stacking.

His suggestions include shipping cases that are oblong-shaped for easy stacking, also easy-opening types which form tray units for shelf display. Rasmussen also urges use of low-cost cases where less package protection is needed on short-haul trips.

Packages which complicate price marking are the pet peeve of George P. Kokalis, president, Sure-Save Inc. He lists these chief offenders: Conical cans, small-diameter screw caps, transparent bags that lack a white bullseye, and lids with too much printing and illustration.

He's also critical of partially filled containers—like carton-packed dry cereals—that occupy too much "air" space over shelves. Another: The shipping case whose inadequate opening directions force clerks to turn it around two or three times before finding where it should be opened.

The ability to deliver more product per unit is cited by Val S. Bauman, vice-president, National Tea, as packaging's greatest aid against distribution costs. The method used can *predetermine*, to a great extent, consumption of a commodity by influencing the quantity purchased at each retail transaction.

For example, Bauman points out, packaged gum formerly was sold in individual 5-stick units, but today most sales are in 6-packs, thereby increasing the individual retail purchase six-fold. And potato chips, once vended in individual 8-oz. bags, are now popular in twin-packs that pair two 8-oz. bags, thus doubling the product weight bought at one time.

The National Tea executive wants more thought given to container size, unit packaging, and shipping cases with a view to reducing handling costs. Canned foods, he argues, packed in a single layer of 24 tins, instead of (as at present) two layers of 12 tins each, would permit price-stamping as soon as the case is opened. And the single-tier layout would also facilitate tear-stripping, thus permitting the clerk to slide the tray pack onto the shelf without touching a single can.

Another distribution economy—palletizing of shipments—is still only in its infancy, Bauman feels. He says that much can be done toward distribution of exchangeable pallets for quick unloading of cars and trucks, and eliminating handling of individual shipping cases.

He suggests that manufacturers consider offering a free pallet with every palletload of merchandise. This would encourage wholesalers to order the pallet unit, thereby again predetermining the quantity of purchase (but at the wholesale, instead of the retail, level).

11 Laments of Housewives

Four food editors from Chicago's newspapers told the symposium that housewives are irked by:

. . . Plastic squeeze bottles that pick up odors.

. . . Collapsible plastic-tube-packaged cheese spreads that are hard to dispense after storage in the refrigerator.

. . . Thin, tall bottles that topple over, and which have neck openings too small for teaspoon measuring.

. . . Coffee can lids which, when removed, have sharp, unsafe edges.

. . . Bits of cardboard that get into cake mixes when cartons are opened.

. . . Sardine cans that require a special key opener for each container size.

. . . Paperboard ice cream containers that either tear in two or stick to the product when opened.

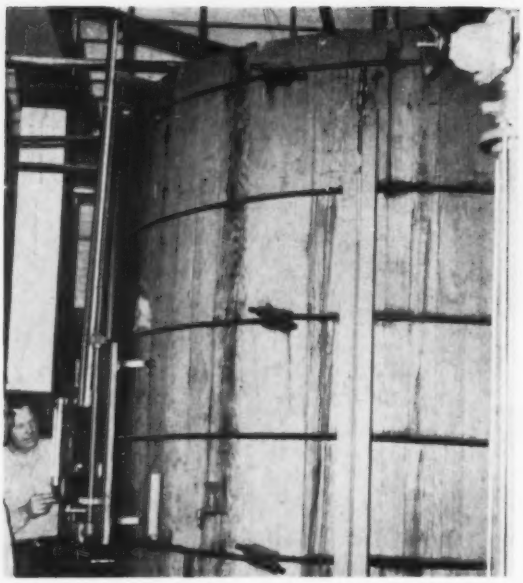
. . . Evaporated milk tins without a rim to 'take' a beer-can opener.

. . . Misleading or confusing package directions. Example: A carton merely carrying the instructions "Just mix and whip"—where only upon opening it does the consumer find complete directions.

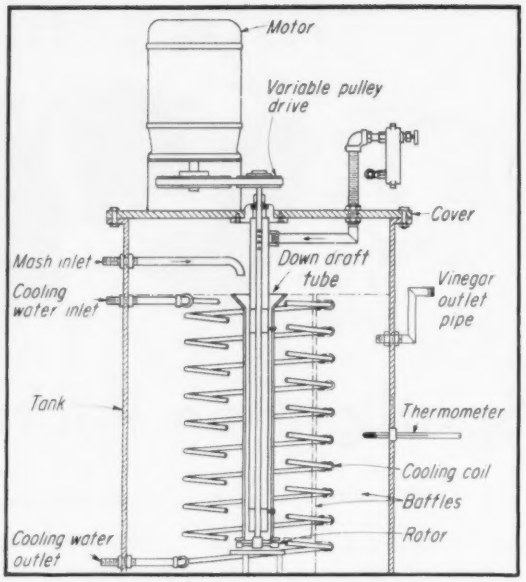
. . . Pouring spouts not firmly anchored, and bags that are supposed to, but don't, open to form a spout.

. . . Deceptive copy conveying the impression that the product is of the "instant" type when, in fact, it's not. —*FE Staff*

For free reprint of this article, write I-2 on Reader Service Card, back of issue



NEW GENERATOR employing Cavitator now continuously produces 1,440 gal. of vinegar per day.



HOW SYSTEM WORKS is shown in this plan of pilot model used for preliminary tests.

Makes Vinegar Continuously

Operating on cavitator principle, Chicago manufacturer's advanced system produces intimate air-mash mixture in generator . . . Use of beechwood shavings eliminated, and efficiency nearly doubled

CONTINUOUS PRODUCTION of vinegar with an efficiency exceeding 98% is now possible at the plant of M. Steffens & Co., Chicago, through employment of a new air-incorporation principle in the generator.

In addition, the new system has:—

1. Eliminated use of beechwood shavings, previously associated with vinegar production. These had to be removed and washed when slime formed, and when production runs were switched from one type vinegar to another.

2. Replaced 92 packing-type generators. New unit takes only 195 sq. ft.

3. Minimized downtime. Generator can be converted directly from one type production to another without stopping.

4. Improved quality. Vinegar eels are no longer a problem.

5. Cut labor cost. Only one man is needed to prepare the mash, etc. And once continuous cycle is set, instruments take over.

R. F. COHEE and GROVER STEFFEN

Respectively, Food Technologist, Wheaton, Ill., and Executive, M. Steffen Co., Chicago

Way It Was Done

We had two batch-type submerged fermenters (each producing about 1,000 gal. vinegar per day), and 92 packing-type generators (turning out about 1,380 gal./day). Efficiency of the fermenters was satisfactory, but we were interested in a continuous method.

So, when we read about use of the Yeoman Cavitator in aerating wastes at a New Holstein, Wis., dairy (FE Sept '54, p. 51), we visited the plant to see the unit in operation. And being impressed with it, we purchased a pilot model and carried on extensive tests.

This pilot unit performed successfully. So we purchased a commercial size acrator and operated it continuously for several months on various types of vinegar. It was then installed in a 2,000-gal. tank in our plant.

Aerating unit consists of a vertical draft tube with lower diffusion plate, multi-blade, non-clogging rotor, vertical hollow shaft and driving mechanism (see accompanying drawing). Mash is fed through downdraft tube.

"Intimate Mixture"

When rotor speed exceeds a predetermined value, air is drawn down through hollow shaft and disperses into the mash. Rotor's nozzles produce an intimate air-mash mixture that spreads out toward tank's walls before rising.

Mash is recycled—flowing to sur-

How Different Vinegar Generators Stack Up

Type	Upright 4x8 ft.	Upright 6x16 ft.	Giant Automatic	Oldest Orleans	Submerged Fermenter	Cavitator Batch	Cavitator Continuous
Batch	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Packing type	Yes	Yes	Yes	No	No	No	
Continuous	Yes	Yes	No	No	No	Yes	
Labor involved	Much	Much	Some	Some	Some	Little	
Efficiency (percent)	60–80	70–80	90–92	50	95–100	95–100	
Air source	Draft	Draft	Blower	Atmosphere	Impeller	Impeller	
Generators needed*	78	8	1	5,000 bbl.	1	1	
Capacity generators (gal.)*	749	3,379	16,320	50	5,115	2,820	2,820
Total capacity needed (gal.)	58,422	27,032	16,320	250,000	5,115	2,820	2,820
Generator space (sq./ft)*	2,500	748	780	35,000	195	195	195
Tank height (ft.)	14	20	25	8	24	14	14
Cooling water (55F.)*	None	None	390 gal. hr.	None	520 gal. hr.	520 gal. hr.	520 gal. hr.
Estimated labor costs at $2 per hr.*							
Standard time	8,320	4,160	2,080	4,160	2,080	2,080	$2,080
Overtime	2,968	1,484	1,484	.....	1,484	1,484**	..... ***
Total	11,288	5,644	3,564	4,160	3,564	3,564	2,080
Foam	None	None	None	None	Yes	Yes	
Cost of foam control per gal. or per day	.....	.....	.....	.....	$0.44	$0.24	
Cleaning and repair	High	High	High	High	$16	$16	
Bushels of beechwood shavings per yr. (for all except white distilled.)	60	350	1,545	.....	.....	.....	
Cost shavings per yr.	$1,150	$687	$1,170	$2,000	.....	.....	
Gal. absolute alcohol converted per 24 hr./gener.	0.9	9.0	70	0.0144	80	80	
Filtrability of vinegar	Good	Good	Good	Fair	Poor	Poor	
Approx. cost per gal. to stabilize ¢/gal. cider, vin.	$0.28	$0.28	$0.28	$0.28	$0.28	$0.28	
White vin.	.....	.....	.....	.....	0.3	0.3	
Stability of filtered, untreated vinegars	Good	Good	Good	Good	Poor	Poor	
Stability of filt. treated vinegars	Good	Good	Good	Good	Good	Good	
Cost of nutrients (¢/gal.) Cider	None	None	0.057	None	0.057	0.057	
White	0.140	0.140	0.072	.....	0.140	0.140	
Wine	None	None	0.040	None	0.040	0.040	

* To produce 360,000 gal. of 60. gr. vinegar per year.
** For batch process.
*** Unmarked factors identical With batch process.

face of generator, then down through draft tube to again combine with air.

Generator operates continuously—24 hr./day, 7 days a week—converting 50-80 gal. of absolute alcohol into 6% vinegar daily. Average production is 1,440 gal. Production of the previously used packing-type generators (1,380 gal./day) represented an efficiency of only 70%.

We use about 30,000 gal. of mash (5.8% alcohol, 0.3% acetic acid) prepared ahead of time. Mash is pumped to a 5,000-gal. holding tank supplying a 30-gal. float-controlled surge tank that feeds the Cavitator through a flowmeter.

Rate per min. (about 1 gal.) is determined by level-gaging capacity of generating tank to edge of draft tube and then dividing by 1,440 (number of minutes in 24-hr. day).

Filtered air is flowmeter-measured and pulled into rotor shaft. Air flow may be changed either by valve-adjusting rotameter or by altering drive shafts' pulley ratios. Our newest pilot model is equipped with three sizes of pulleys mounted on hollow drive shaft. To date, the commercial unit is less sensitive to changes in pressures, aeration rates, temperature differentials, and cooling conditions, than the pilot generator.

Air seems to be more effectively utilized by our commercial-size unit, too. This is also true with reference to the submerged-type fermenters that we operate. Submerged fermenters are also more critical to cooling-water control, and foam is more difficult and expensive to control.

If a liquid fat defoamer is needed (always with malt and cider, and frequently with wine, corn sugar, and white distilled vinegars), it can be introduced into incoming stock or added by means of a simple oiler conveniently located atop Cavitator lid. Preferably, defoamer liquid should drop into draft tube.

Discharge is syphoned through a "T" pipe so overflow can be adjusted to equal intake of vinegar stock. Due to arrangement of baffles in the tank and the cavitating action, there is little surging.

Focus on Operation

To start up our commercial unit, we operate it batchwise for several days, using, say, a 1- to 2-week old cider mash containing 45-grain alcohol (45% by volume) and 15-grain acid. (Storing stabilizes the mix by controlling the flow—killing off wild bacteria.) Stock is introduced at 70-78F. starting temperature, with air continuously metered at 6-9 cfm. Then air feed is slowly increasing to 20-27 cfm.

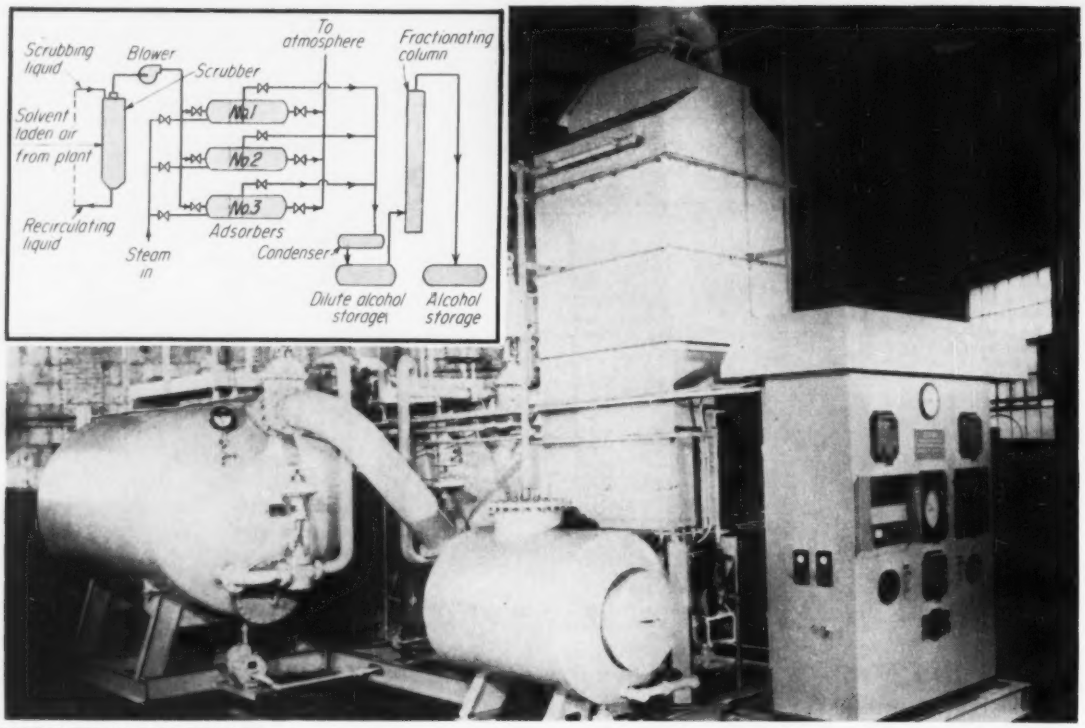
About one-third of the finished vinegar batch is retained, with the rest rapidly withdrawn while the aerator keeps operating. After several such maneuvers, approximate production rate is calculated in grain-gal/hr. Thus, we have another way of establishing continuous flow rates.

When production of 1 grain of acid per hour is achieved, batch is permitted to run almost to completion (0.2-0.3% residual alcohol). Then generator is switched to continuous, with mash fed at the precalculated rate. Mesh feed pipe is adjusted along with draft tube (to level of discharge pipe) for uniform overflow of finished vinegar.

Vinegar generation—oxidation of alcohol to acetic acid—is an exothermic reaction that calls for close temperature control. Liquid in generator is thermostatically maintained at an optimum 85-88F. by circulation of cold water through coils. Flowmeter measures cooling water through a solenoid-operated valve in the line.

During winter months, we use previously prepared mashes stored in stainless vats as the coolant instead of water, thereby bringing them up to desired generating temperature.

As to mashes for continuous production, they may be 55-grain alcohol and 5-grain acid. Therefore, when converting to continuous production the batch (producing a 60-grain acid vinegar) should run to about 57-grain acid before feeding mash continuously. —*End*



MORE THAN $100 WORTH of previously lost solvent is recovered daily by this unit at Exchange Lemon Products. Inset shows layout.

Solvent $$ Saved from Air

Package system employs activated carbon to recover alcohol formerly dissipated to atmosphere, thus saves money for lemon processor

SOLVENT PROCESSING can be bolstered with many benefits through installation of packaged recovery systems using activated carbon.

These systems materially reduce solvent losses that normally occur through exhausting of vacuum pumps and evaporation from processing tanks and other equipment to the atmosphere.

Further, they eliminate unpleasant, hazardous vapors from operating areas.

And they obviate possible criticism from air-pollution-conscious officials.

A case in point is Exchange Lemon Products, Corona, Calif., which uses isopropyl alcohol in the manufacture of pectin and pectate from lemons.

This company enlisted the aid of Barnebey-Cheney Co., Columbus, Ohio, producer of gas adsorbent carbons, whose engineers designed a 50,000-lb. unit, pre-assembled and pre-piped at the factory. This package system recovers 35 gal./hr. of alcohol from 2,000 cfm. of air. It is fully automatic and requires no operating labor.

J. B. WITWER
Public Relations Director, Barnebey-Cheney Co., Columbus, Ohio

Here's How It Works

First step in its operation is passing the air through a rubber-lined scrubber in which a sodium carbonate solution is circulated to neutralize trace quantities of hydrochloric acid. Then the blower discharges the solvent-laden air through a bed of activated carbon, where alcohol vapors are adsorbed.

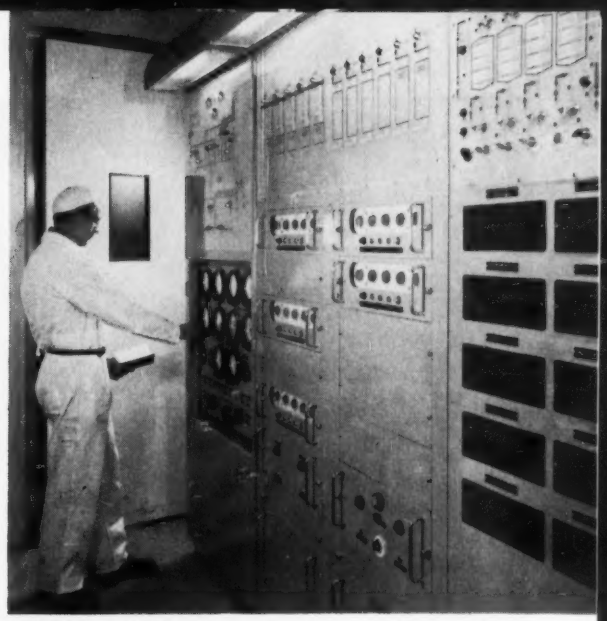
After a period of time, the carbon becomes saturated with vapor and is automatically isolated from the system and replaced with a second adsorber. Steam is admitted to the first "Sorber", thereby steam-distilling the isopropyl alcohol from the carbon bed.

Mixture of steam and solvent is then directed to a condenser, from which the condensate (35-40% alcohol) flows by gravity to intermediate storage. Final dehydration to the azeotrope (12.6% water) is accomplished in existing fractionating equipment.

Cost of recovering the isopropyl alcohol is approximately $0.06/gal. for a solvent that has a market value of about $0.42/gal. —*End*

Plant of the Future *Today*

New British ice cream factory features automatic central-panel control of receiving, mixing, and freezing. Cleaning is automatic



CENTRAL PANEL keeps operator posted on action throughout plant. It enables him to control receiving, mixing, and freezing. Right section indicates condition of liquid ingredients in storage. Center one records production. Left one automates cleaning.

AUTOMATION is the word for the recently opened ice cream plant of giant British food manufacturer, J. Lyons & Co., Ltd., at Greenford on the outskirts of London.

With accent on efficiency and sanitation, the $5,000,000 plant has three outstanding features: (1) An electronic central control panel; (2) second floor processing, and (3) automatic cleaning and sterilizing.

One operator at the panel controls receiving, directs raw materials flow, and monitors the mix-making procedure. Only carton packing of the finished, wrapped ice-cream is done by hand.

The panel gives a minute-by-minute inventory of stocks and mixes, also indicates temperatures throughout the plant.

Planned, but not yet installed, is automatic logging of all weight and temperature data from the panel. Installation will consist of a desk-mounted printing unit adjacent to the control panel.

Receiving, Mixing 'Panelized'

All raw materials—fats, sugar, concentrated milk, fruit, and other flavorings—arrive at the plant in liquid form. Tankers delivering the products are connected by pipeline to the plant's receiving point. Control panel operator then sets his switches and the panel takes over. As one storage vat is filled, flow is automatically transfered to another.

Load cells beneath the storage vats weigh contents and flash results to the control panel, where readings are in 50-lb. increments.

To start mix production, panel operator simply throws a switch. Then electric circuits trigger compressed-air valves in the pipelines and materials are pumped to the mixing area.

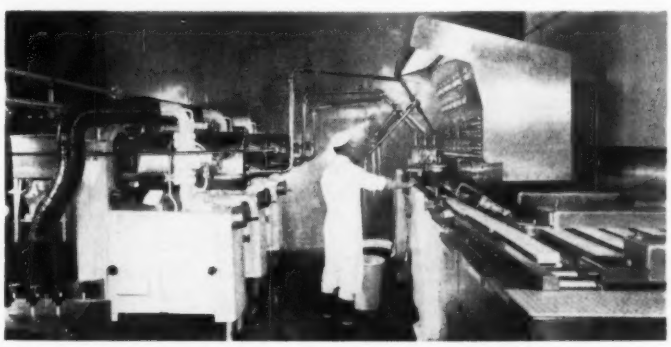
Here ingredients are assembled according to Lyons' formulas—proportion of each being set on a panel alongside the mixers. Pre-set valves, (one for each ingredient) open in sequence and materials are delivered one-by-one into a scale-mounted pan.

When all are added, mixture is automatically dropped into an agitator-equipped tank, to enable immediate assembling of another mix in the scale pan. In addition to being under control of the formula panel, these operations are recorded on the central panel.

Continuous Mixing 'On Test'

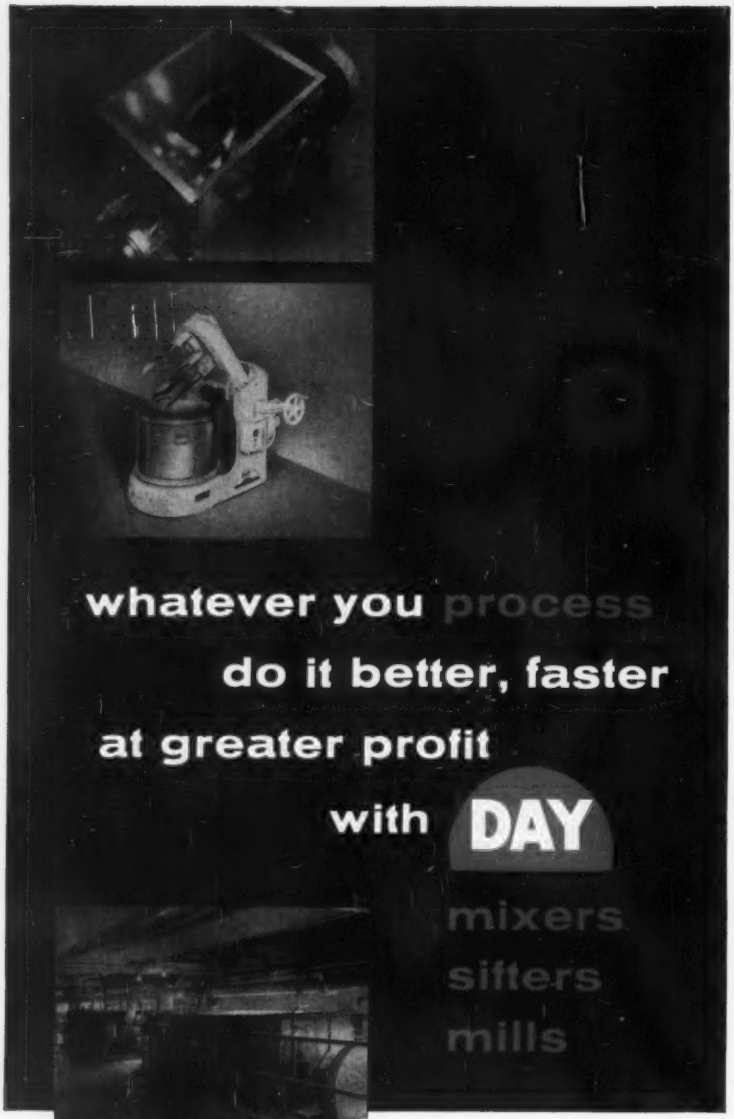
A mixing method which eliminates the weighing stage is under trial at the plant. In it, ingredients are fed to a proportioning unit, consisting of eight separate pumps (one for each ingredient). Stroke of each pump piston is pre-adjusted to deliver desired volume of liquid entering the mixing pan.

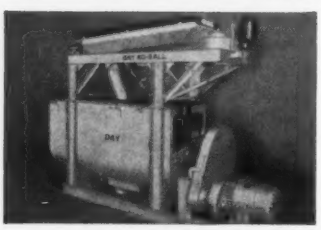
When fully mixed and slightly

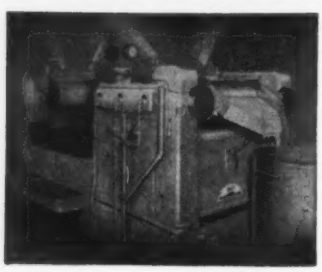


SLEEVE-WAY machine (right) receives ice cream from bank of continuous freezers (left), extrudes it in ribbon onto moving cardboard blanks. After cutting into family-size portions, blocks are wrapped, sealed and fed into freezing unit (right foreground).

SHIRLEY KENDRICK
McGraw-Hill World News, London







DAY mixers, sifters, blenders, roller mills and pilot plant equipment are found in every major process plant, helping produce better products, that sell more profitably. Manufacturing techniques that achieve a high degree of efficiency allow you to purchase Day equipment economically. Lab facilities are available to test your product. Equipment Catalog sent on request.

J. H. DAY Company
Division of The Cleveland Automatic Machine Co.
SERVING THE PROCESS INDUSTRY SINCE 1887
4924 Beech Street, Cincinnati 12, Ohio

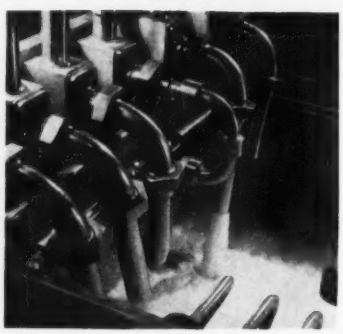
heated, product is filtered and homogenized. Then it is pasteurized by heating to 175F. for at least 15 sec. Should any part of mix not reach this temperature it is automatically returned for repasteurization. There is rapid cooling of mix to below 40F., then it's pumped to large stainless steel vats for holding until final freezing.

Storage Vats Robotized

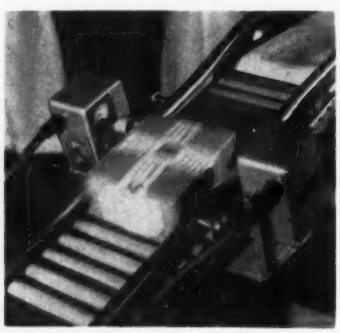
Temperature of mix is automatically maintained by special cooling equipment attached to each tank. As a further safeguard, vat agitators come into action at pre-set intervals. Temperature in each vat is recorded on charts mounted on its front, and the information is relayed to the central control panel.

When mix is ready to freeze, con-

Mixing and Counting



FOR CONTROLLED MIX-MAKING, ingredients are fed (one at a time) from individual lines into scale-mounted vat. When completely assembled, mix is dropped into agitator-equipped tank.



'EYES' COUNT PACKAGES of frozen products as they move into hardening rooms. These counts are relayed to central control panel to keep operator informed on production.

trol panel operator directs it from vats to freezers. Frozen product is machine-cut and wrapped, then moves through a freezing tunnel to packers. Sealed cartons pass down a chute into cold storage rooms. As they enter these rooms, cartons are electronically counted and the results relayed to the central panel on the floor above.

Lyons processes on the second floor, believing this to be important for sanitary reasons. Since dirt tends to lodge on the miles of piping, and can be difficult to get at, the plant's designers thought it cleanlier to have these conduits under, rather than above, the food.

All piping comes up through the processing floor from the stores, refrigeration plant, and power rooms downstairs. Further, all lighting and ventilation is flush with the ceiling. Result is a clean, unobstructed production area.

To allow for continual hosing-down, floors, ceilings, and walls are completely waterproof. Machines are of stainless steel, making for easier exterior cleaning.

To prevent entrance of dust and other contaminants through open doors, air inside the building is maintained at a pressure slightly above that outside.

Pushbutton Cleaning

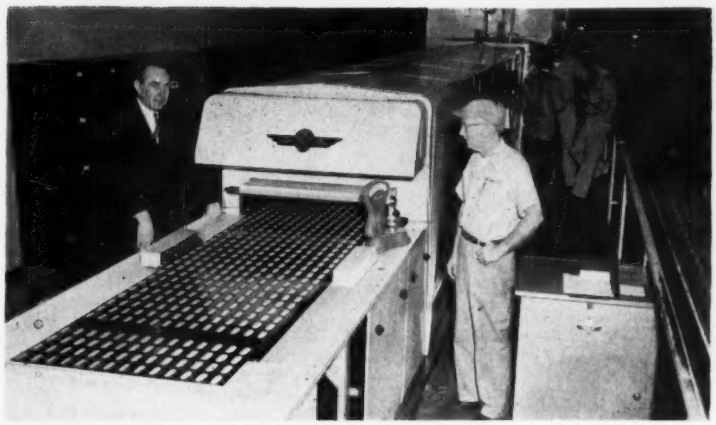
Apart from controlling ice-cream production, the central panel plays an important role in cleaning of equipment.

Every night when the plant closes down, panel operator sets a series of time switches which trigger a very thorough cleaning and sterilizing system.

Hot water, detergents, sterilizing agents, and hot water rinses flow through the miles of pipes used to distribute liquid ingredients and ice-cream mix. Storage and mixing vats are cleaned and sterilized by a series of automatic sprays. Entire operation takes 2 hr.

For cleaning floors, walls, ceilings, and equipment, a number of depots are located throughout the building. There are washing and sterilizing trolleys for cleaning large single pieces of machinery.

The new facility is the largest of Lyons' five ice-cream plants, but the company declines to give output figures. In a good week the firm sells "14-million portions" of ice-cream. But a portion can range from a tablespoonful to a family brick. —*End*



PREMIUM-LINE COOKIES are specially quality-controlled for flavor-retention and overall palatability by precision heat transfer in new Belgian oven. Check-weighing station is seen at right.

Unique Oven Guards Quality

Its special thermal-control system optimizes the balance of heat transferred to cookies by radiation, conduction, and convection

THREE-WAY CONTROL of heat transfer in a special cookie oven plays a major role in an outstanding production achievement at Pepperidge Farm's Downington, Pa., plant.

By applying latest bakery-engineering know-how to old Belgian fine-pastry making, the company has geared this art to modern standards of quality control and production.

Prime feature of the 150-ft. Belgian band oven employed is precise balancing of heat transferred to cookies by radiation, conduction, and convection. And this control is vital to flavor retention, optimum texture, and palatability of the company's premium line of Delacre and Monte Carlo cookies.

Consider the cookie-baking process which has, as its main objective, the uniform evaporation of dough liquids. Controlled heating also actuates desired chemical reactions, such as dextrinization, caramelization, and formation of aromatic esters which, to a large extent, determine final flavor characteristics. Variable heat transfer, on the other hand, can cause localized turbulent boiling and loss of essential aromatics.

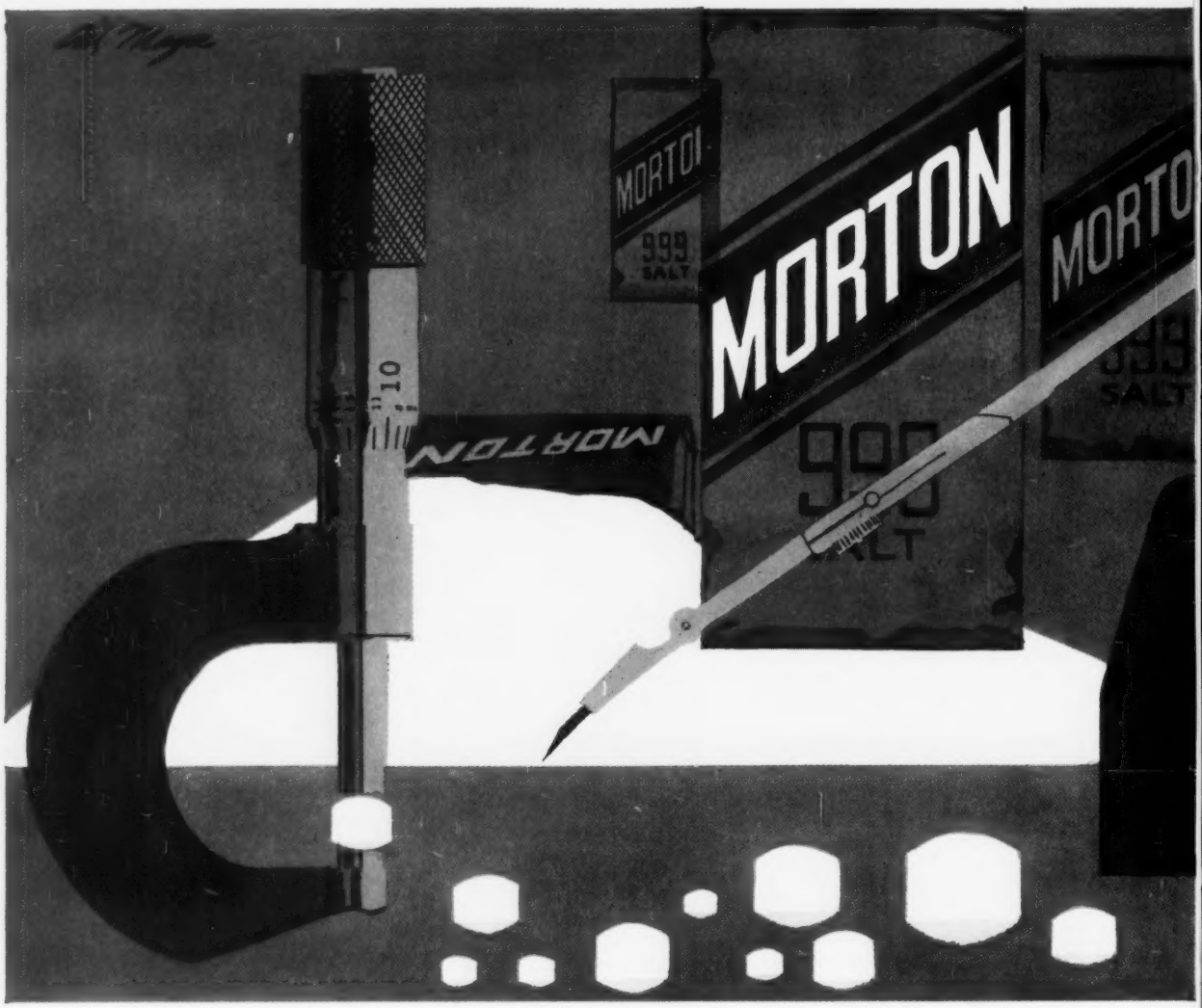
Here is how these factors are monitored in the new oven (Ooms Rocket, Ateliers C. Ooms S. A., Morstel, headquarters, Antwerp):

Of the indirect-circulating type, the unit is divided into eight sections with full-surface top and bottom radiators. Each is thermostatically controlled for 1-deg.-F. regulation and 2-deg.-F. modulation of heat input from 0-100%. Burners are automatic, with electric ignition and electronic flame safeguard, and each combustion tunnel has explosion-relief panels.

Surface temperature of top radiators determines the amount of heat directly radiated to the cookies. This temperature corresponds to a definite concentration of infra-red energy at a particular wavelength, since there are no interfering combustion products in the baking zone. Most gases are transparent to radiant-heat transfer, but carbon dioxide and water vapor do selectively absorb and emit radiation. This is important only in direct-fired ovens, however.

Energy emitted by bottom radiators is mainly absorbed by the steel band and transferred by conduction. Control of bottom-radiator temperature stabilizes this variable.

Finally, each oven section has dampers that are adjusted to regulate the speed of air movement around the cookies, thus controlling heat transfer by convection. —*End*



Only Morton offers you the right salt, in any form–

Morton '999' Salt is the highest purity salt commercially available everywhere in the United States. '999' is a low price, premium grade salt entirely free from bitter calcium and magnesium compounds that can distort flavor. Morton '999' is always 99.9% clean, pure sodium chloride, exceptionally low in the trace metals copper and iron.

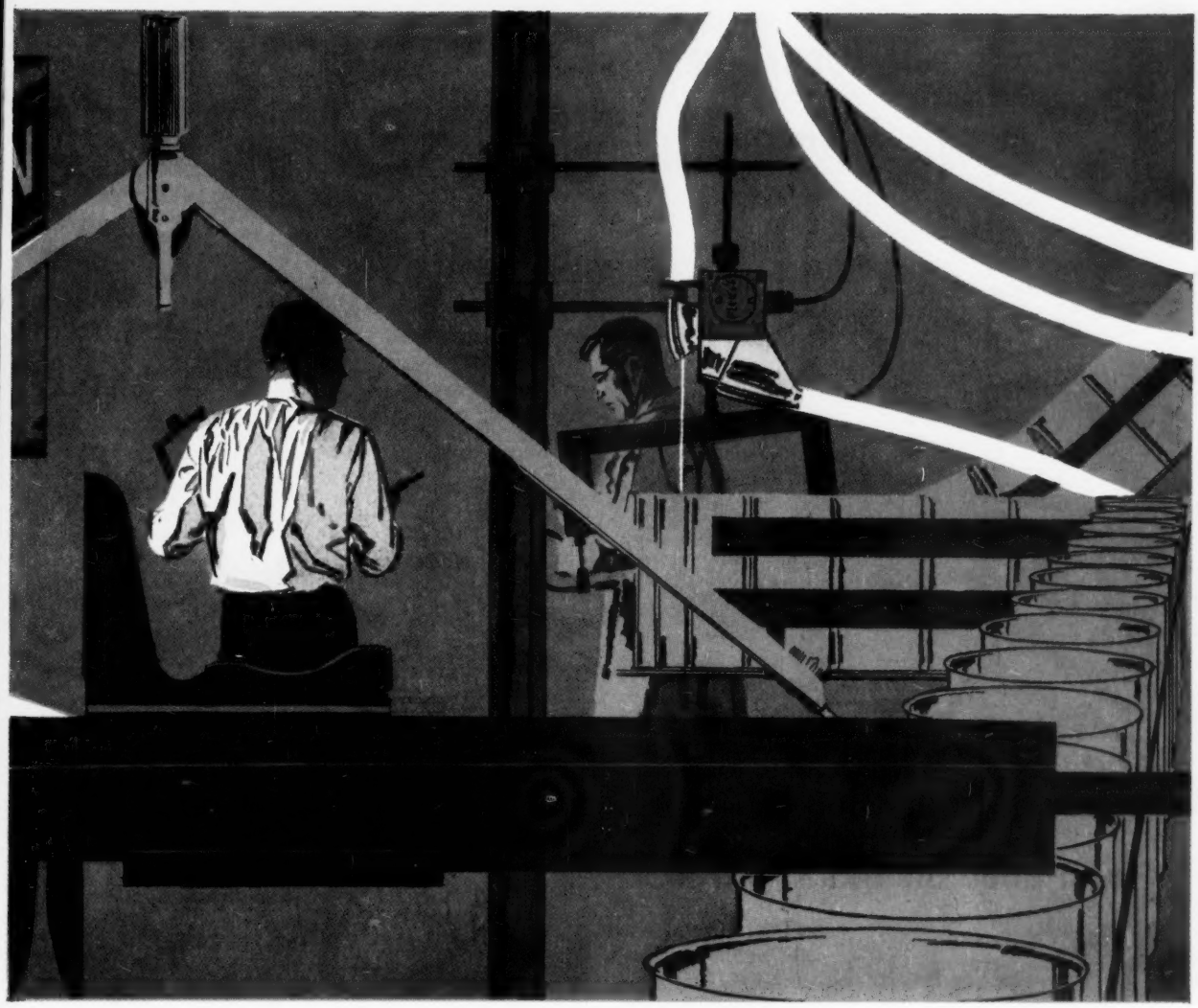
What's more, '999' quality never varies from shipment to shipment whether you buy a bag or a carload.

Morton also offers you high purity '999' Salt in handy tablet form. You get tablets that are always the exact weight, size and blend you require for accurate flavor control.

Morton combination tablets are precision made to your exact requirements. You can order Morton Salt blended in unvarying amounts with ascorbic acid . . . spices . . . citric acid . . . sulphur . . . M.S.G. . . . calcium chloride and other flavoring agents. Tablets come in 10-grain to 400-grain sizes.

Morton offers a complete line of tested and approved dispensers to help you reduce labor costs, eliminate waste and assure better flavor control through accurate dispensing of seasonings and preservatives. Technicians are available to help you select and install the dispenser or brinemaker best suited to your needs . . . to assist with initial use and provide regular follow-up maintenance to assure efficient, trouble-free operation that saves you time and money.

All Dispensing and Brinemaking devices are installed and serviced by Scientific Dispensing Company Division of Morton Salt Company.



and dispensing service to meet your special needs

The amazing Flocron Liquid Dispenser works electronically—remote controls permit you to "dial" the exact amount of liquid ingredients required for various can sizes. Handles up to 300 units per minute. Can be operated on existing equipment without revising existing production lines.

The Salt Tablet Depositor automatically deposits salt tablets in as many as 700 cans a minute. Guaranteed accuracy. Automatic models work on a "no can, no tablet" and a "no tablet, line stops" basis. Depositors come in special sizes . . . will place tablets in narrow mouth bottles, cans and jars.

The Morton Model-E Brinemaker is specially designed to produce up to 800 gals. of brine per hour from readily available '999' Salt. No space-wasting storage tank needed. No need for costly shutdowns for cleaning out sludge or impurities.

The Bulk Salter Machine dispenses salt, sugar, M.S.G., and other seasonings in dry form. Serves up to 400 cans per minute—if no can is present, no seasoning is released. Machine can be filled and supervised by unskilled labor.

Write today for more information!

We'll be happy to send you more information about high purity Morton '999' Salt... the Model E. Brinemaker... Flocron Liquid Dispenser... Bulk Salter Machine or the Salt Tablet Depositor.

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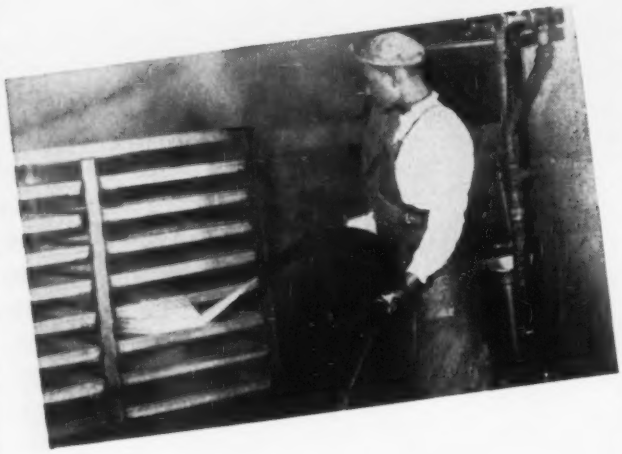
WASHDOWN HOSE

Washdown hose that's never a washout

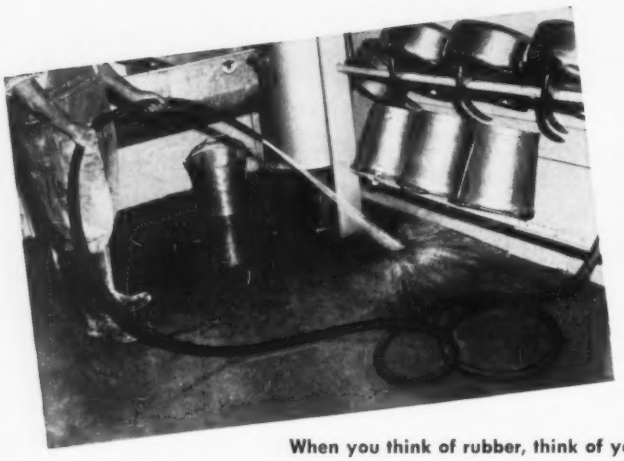
FOR HOT WATER OR LOW-PRESSURE STEAM



For washing, cleaning and sterilizing equipment, this specially compounded **U. S. RAINBOW® CREAMERY HOSE (STYLE P-255)** has a white, strong and flexible cover, resistant to destructive effects of grease and lactic acid. Nozzle can be built integral to prevent chipping of fragile linings in tanks and sterilizers.

U. S. PACKER'S WASH-UP (STYLE P-7093) is very flexible, but very rugged. Four-ply carcass duck assures easy handling, perfect balance. Cover of black neoprene resists destructive action of animal fats, oils, and abrasion.

FOR COLD OR WARM WATER



U. S. PEERLESS® WATER HOSE (STYLE P-365) has a tube of extruded natural rubber to provide a smooth waterway. Carcass of braided rayon for longer life in high-pressure service. Highest grade brown cover is specially compounded for resilience, resistance to abrasion and other abuse.

This attractively priced hose, **U. S. RAINBOW WATER HOSE (STYLE P-340)**, has a carcass of exceptional strength and flexibility, thanks to two braids of high-twist cabled rayon. Tough rubber cover resists abrasion from dragging or scuffing. Seamless tube of special rubber stock.

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Steam-Saving Check List

It goes without saying that steam leaks should be avoided, and here is a check-list of other steam-saving precautions:

1. Keep pressure at required minimum to reduce radiation and leakage losses.
2. Insulate roofs, walls and pipes. One-foot of uninsulated 2½ in. pipe wastes $2.50 worth of steam a year. Remember, too, contours or exposed areas of valves, flanges and fittings are equivalent to far more than their actual length.
3. Shut-off steam to dead pipes.
4. Keep filters and heating surfaces clean, unimpeded.
5. Trap coils individually, return condensate to boiler.
6. Flash high-pressure condensate into low-pressure mains, return as much excess heat as possible.
7. For small demand in remote locations, or in rooms occupied during set-back periods, consider electric heat. (In one instance we were using several hundred lb steam/hr. to keep lines hot and supply a remote location requiring but 30 lb/hr.)
8. Provide test-tees on traps.
9. Use boiler water-treatment to prevent foaming, carryover.
10. Develop heating standards from actual tests. (e.g., pressure, number of heaters, hours of operation required at varying outdoor conditions.)
11. Use thermostatic controls, carefully set, for heaters and timers.
12. Keep doors and windows closed. When ventilation is necessary use electric eye systems for doors and window openers, with time-delay closing systems. Repair leaky sash. Replace broken glass in windows and doors.
13. Use floor-level inlet ducts for heaters. In high-ceiling areas use down-blow heaters.
14. Arrange unimpeded and overlapping heater flow-pattern.
15. Establish heating zones—shut-off or reduce heat in unused areas.
16. Conduct PM checks of traps, vacuum leaks and reducing valves.
17. Keep ventilation exhaust at required minimum. Shut-off when not required.—*Arthur F. DeLong, Plant Engineer, Electric Storage Battery Co., Philadelphia* (from address Plant Maintenance & Engineering Conference).

Clamp-Trucks Speed Case Handling

With two-lift-trucks equipped with carton-clamps instead of usual forks, Illinois Canning Co., Hoopeston, Ill., achieved these results during a recent corn pack:

Handled 375,000 cases in 3 weeks . . . Unloaded-stored 40,460 cases during one 22-hr. run . . . Saved approximately $8,000 in cost of new pallets.

The clamps handle unit loads of 50 cases without pallets. They are mounted on Clark Equipment Co.'s 4,000-lb. lift trucks. They pick up a load by squeezing sides of unit with enough force to lift and carry it—without damaging cases or denting cans.

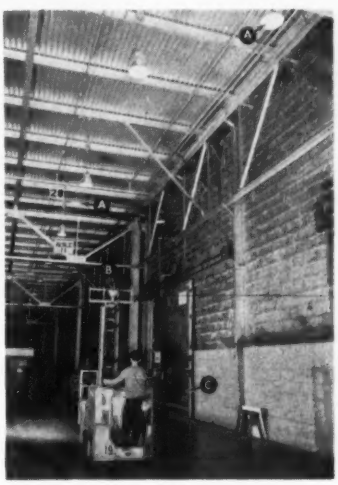
Two workmen stack unit loads (5 layers of 10 cases) six to a trailer. At warehouse, clamp-trucks remove units and tier them in storage, 20-cases high. For shipment, this procedure is reversed. Elimination of empty pallet handling has speeded up the overall cycle.

"Eyes" Automate Door Action

Recently, we installed radio-operated, door-opening devices on our fork-lift trucks and doors leading into refrigerated rooms. These worked quite efficiently until the packaging department purchased several high-frequency (27 megacycle) Saran sealing units which triggered the radio devices.

We solved this problem by replacing the devices with photoelectric eyes—two above aisle outside each door (A), and two inside the rooms. To open or close a door, lift-truck operator merely presses a button on dash of truck. This actuates light (B) at top of truck's boom to trigger electric-eye under which it is passing.

Doors are operated by chain drives powered by ½ hp. 3-phase reversible motors, or manually by pushbuttons. As a safety measure, they will reverse direction if either of two plates (C) located on edges of doors, encounters any obstruction or resistance. These spring-loaded plates, which extends 6 ft. from floor-level, trigger a sensitive switch which reverses drive motor.—*Grant Vroman, Chief Electrician, Diamond Walnut Growers, Inc., Stockton, Calif.*



kill foam with a Dow Corning SILICONE DEFOAMER

Is foam giving you the old "one-two"? One—slowing up your processing . . . two—running up your costs? Fight back hard. Knock out foam fast, with Dow Corning silicone defoamers . . . most efficient foam killers known!

1 oz kills foam in:

208,333 lb lobster tank brine

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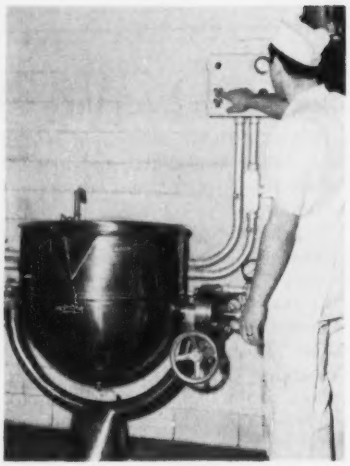
Practical Ideas



Pushbutton Steam Control Automates Kettle Operation

We came up with a fistfull of benefits by installing a pushbutton control on the steam line to a stainless jacketed kettle for cooking 60 gal. batches of cake icings. Here are just a few—

▶ **Safety.** Operator cannot burn himself as a result of a leaky valve stem.

▶ **Simplicity.** Operator just pushes a convenient button instead of having to open and close a valve.

▶ **Improved Heat Control.** Desired temperature is attained, either automatically through thermocouple and air-operated modulating valves, or manually by adjusting air switch.

System (photo) consists of a pushbutton, air-operated modulating valve (Johnson) in the steam line. When button is pressed current flows to a solenoid hooked up with the 15-psi. air line. (Pilot light goes on, too.) The pressure opens valve in steam line. According to setting of air switch, pressure varies to close or throttle valve. For emergency use, a manually-operated valve was also installed in the steam line.—*Minos Asproyerakas, V. P. & Chief Eng., National Baking Co., Chicago.*

Pre-Assembled Freight

Two new techniques have been advanced for lowering truckers' handling costs.

Proposed in the first is use of a trailer-size box which opens at all four sides. Trailer beds and warehouse floors are equipped with roller-conveyors on which these boxes are moved. By lift-truck, full boxes are pushed into, or pulled out of trailers. This method would permit quick turn-around time for trailers,

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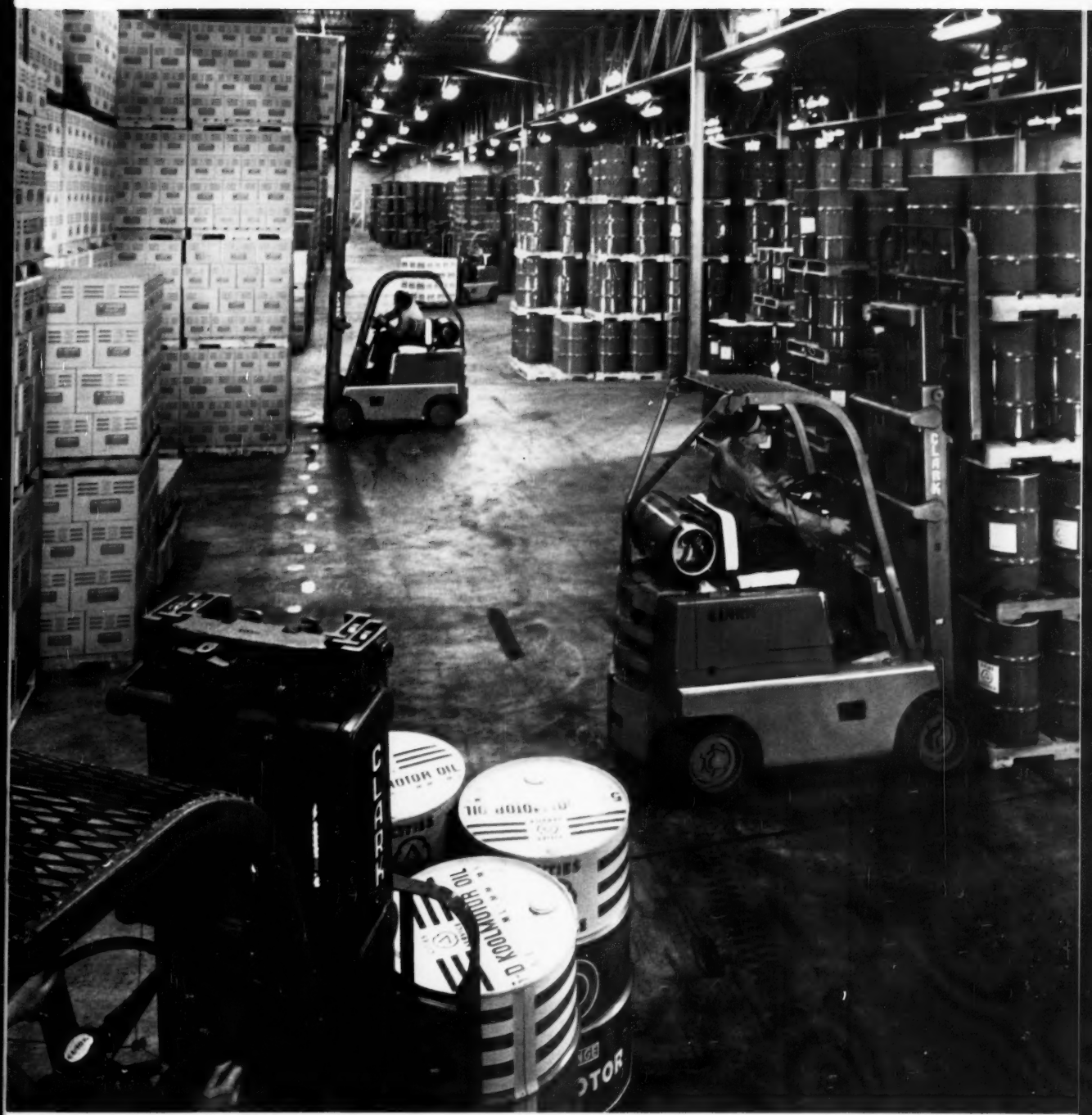

You're paying for new trucks...why not own them?

Times change. So does equipment efficiency. The new *Clarklift* fork trucks pictured above, for example, have been tested and proved to be 30% more efficient than the average truck in use today. Over four years of designing, testing, and field-proving has demonstrated time and again that *Clarklift* owners get a fast return on their investment in extra production alone.

And, of course, if you have old equipment, there's the high cost of maintenance to consider. If your present trucks are frequently down for repairs, you're paying dollars not only for the parts and labor involved, but you're also paying for lost production, supply and shipping bottlenecks, poor use of manpower. It all adds up. It means you're paying for new equipment every day . . . *but without owning it.*

A planned equipment replacement program is worth investigating. Simply write: Planned Replacement, Clark Equipment Company, Battle Creek, Michigan. We'll arrange to have a representative call to survey your operation and explain the various programs available.

CLARK® EQUIPMENT

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Harold Dodgen Co., Inc., Ozark, Arkansas process 1,200 Dodgen Prime Quality birds an hour.

M-G Poultry Plant, Weimar, Texas

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Then investigate Butler buildings. Many poultry processors, like the above, found that Butler buildings enabled them to build superior – more profitable – plants and still conserve capital.

Butler's clear-span design provides the unobstructed floor and overhead space needed for straight-line flow of materials. The load-bearing frame permits using economical curtain-walls to separate receiving, killing and eviscerating areas of the building.

Butler metal roof and wall panels are easy to clean, require virtually no maintenance. Precision-fabricated to fit tightly, they seal out weather, vermin and rodents. Excellent ventilation, illumination and climate control are "built-in" features of Butler buildings.

Available from stock, precision-made to permit fast assembly, Butler buildings save weeks and months of costly planning and construction time, permit earlier occupancy, earlier profits.

Before you start to build that new processing plant, contact your Butler Builder. Get full details on Butler buildings – the lowest-cost way to build well. He's listed in the Yellow Pages of the phone book under "Buildings" or "Steel Buildings." Or write to us direct.

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obviate high labor costs for manual loading.

Second idea is to employ three-sided cubage boxes in which pre-assembled freight is stored until loaded in trailers. The fork-truck used to load these boxes in trailers, is equipped with a hydraulic ram, that pushes the freight out of the box onto the trailer's floor.—*Clark Equipment Co., Battle Creek, Mich.*

Pans No Longer Slip

At Jewel Tea Co.'s Chicago bakery, equipment arrangement made it desirable to elevate pans of rolls by conveyor to the de-panner.

But coming direct from the oven, these pans are hot and slippery, thus can't be conveyed up the sharply inclined conveyor.

The problem was solved by installing non-electric, magnetic rails Magna-Rails (Eriez Mfg. Co., Erie, Pa.) under the conveyor. By magnetic attraction, pans are now held closely against conveyor and ride safely up the incline (photo).

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COMPAK forms the bag from roll film, with perfect electric eye registration of printed design, and automatically fills from precision scale feed.

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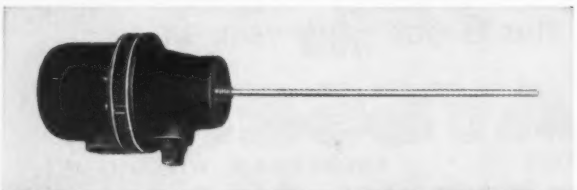
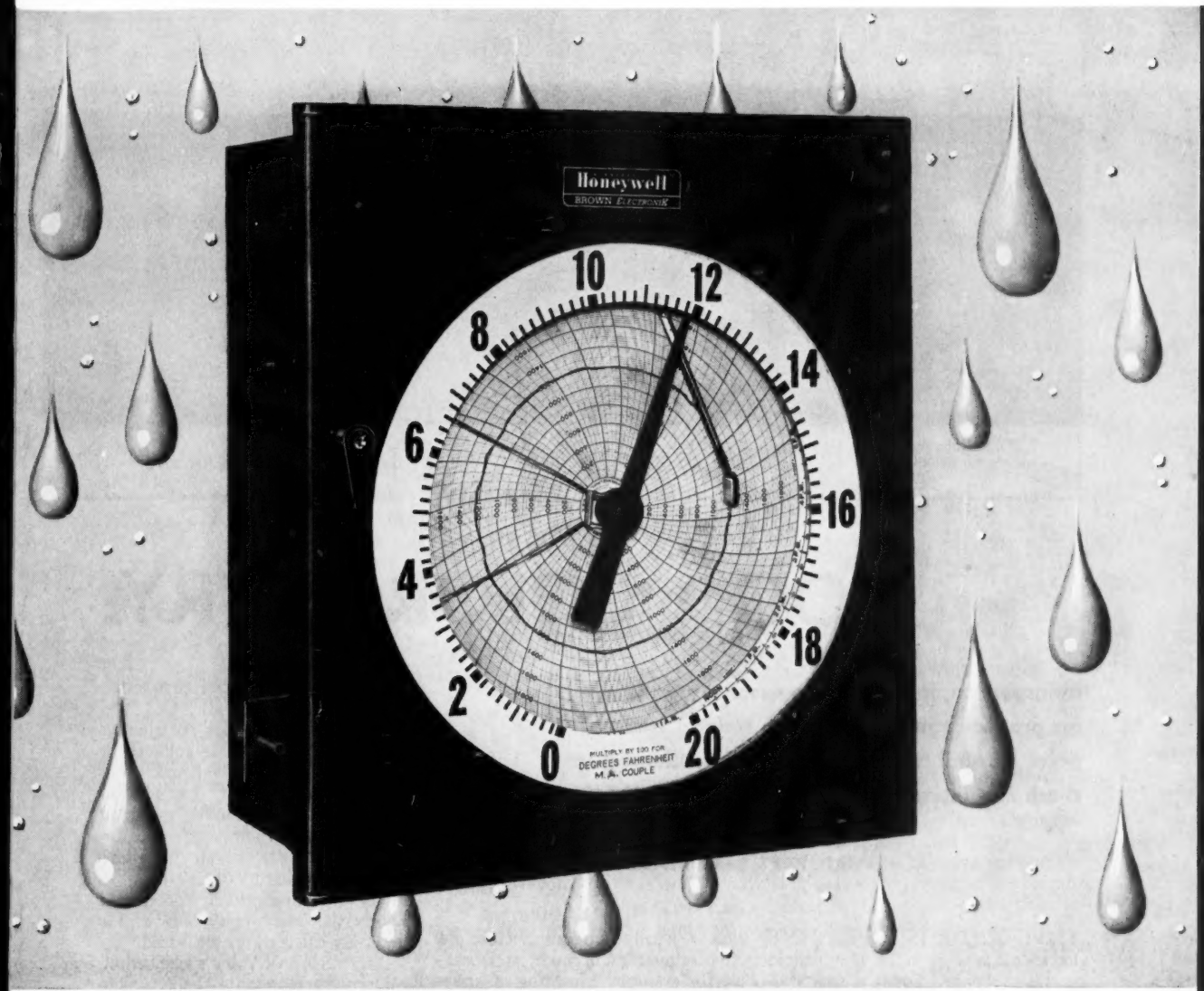
ROLLER TYPE SENSING ELEMENT is used to measure the moisture content of sheet materials. Segmented rollers are available for moisture profiles. When properly insulated, idler rollers on a machine can be used for measuring the average moisture content of sheet materials.



PROBE TYPE SENSING ELEMENT is used to measure the moisture content of granular materials.

THE HONEYWELL *MOIST-O-GRAPH* HAS BEEN TESTED AND PROVED WITH THESE MATERIALS:

POTATO SHEET
COTTONSEED
TOBACCO SHEET
FLOUR
OAT BITS
ALFALFA
OAT FLAKES
CASTOR BEAN
PEANUT MEAL
DRIED BEET BULB
BARLEY AND OATS GRASS
LIMA BEAN VINES
LINSEED MEAL
POTATO STARCH
PEARL STARCH



HONEYWELL *MOIST-O-GRAPH* measures moisture content from approximately 5% to 30% by resistance measurement, with a range of 0-100,000 megohms.

Automation makes any process pay extra dividends in productivity, product improvement and profit. One of the many ways Honeywell can bring you the advantages of automation is through precise, automatic control of moisture in granular and sheet materials.

The Honeywell *Moist-O-Graph* system gives you positive quality control, and lets you maintain a profitable moisture balance in your products. It gives you a continuous, permanent record of moisture content. It leads the way to tangible savings in your drying operations, and lets you use your manpower more productively. Presently installed *Moist-O-Graph* systems have paid for themselves in six months.

Let Honeywell survey your process for best possible application of the *Moist-O-Graph* system. Get complete details from your nearby Honeywell field engineer. Call him today . . . he's as near as your phone.

MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa.

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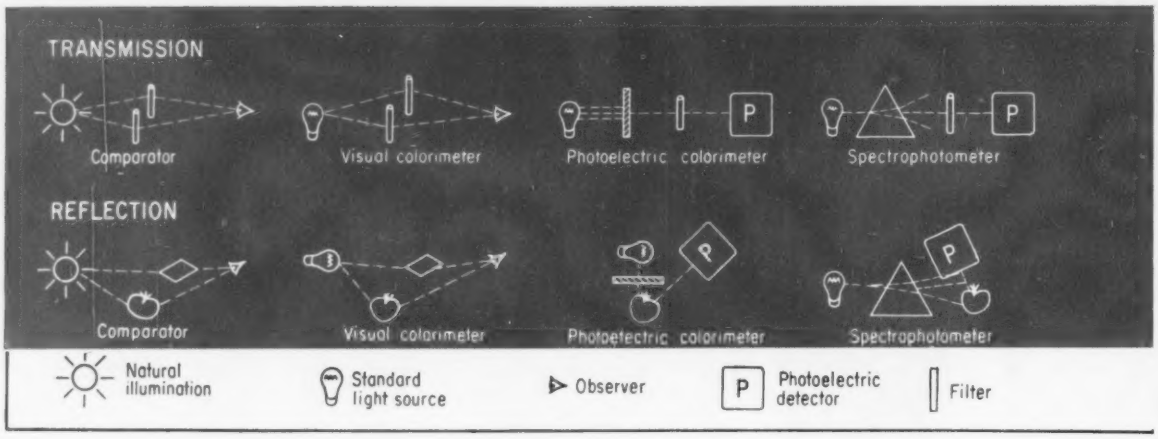


FOOD COLORIMETRY:

In inspection, it enables processor to standardize his products, and comply with Federal specifications. In analysis, it permits the food chemist to check for vitamins, trace metals, and pesticides

SPECIAL REPORT, PART I—AVAILABLE TOOLS*

GIDEON E. LIVINGSTON
Formerly, Associate Professor of Food Technology, University of Massachusetts, Amherst, now Research Laboratories, Continental Baking Co., Rye, N.Y.

THAT COLOR IS IMPORTANT to foods is a premise few people would challenge. For it is nearly always a major factor in appeal of foods.

We associate definite colors with certain products—strawberries should be red, peas green, butter yellow.

Of particular concern to the processor, however, is the fact that consumers expect foods not only to possess the overall color normally associated with them, but to conform to closely established characteristics. In other words, it is not enough for peas to be green, they must be pea green rather than spinach green or celery green.

Also we usually find a definite relationship between quality of raw materials and color of packed product. Hence, USDA's grades give considerable weight to the color factor.

Furthermore, where undesirable storage changes occur, color variation is usually noticeable before any flavor alteration becomes apparent—as, for example, browning of strawberry preserves.

It therefore becomes pertinent to ask: What is color? How can it be measured? How does one specify it? How can the packer best make use of colorimetric methods?

To the analytical chemist, colorimetry generally implies "measurement of color in solution," as used in quantitative analysis.

To the food technologist, however, it denotes "measurement and specification of color." This latter usage is now preferred among color physicists, who advocate the word "absorptimetry" for analytical colorimetry. Actually, the food industry finds equal importance in both areas, and their significance should be well understood.

As an analytical tool, colorimetry (or absorptimetry) enables the food chemist to perform quantitative analyses for numerous food constituents, including many vitamins, trace metals, and pesticides. Generally, when an absorptimetric method is applicable, it is speedier than alternative chemical methods.

Applicability depends on whether or not the substance is colored, or transformable into a colored product. In addition, it depends on whether substance can be extracted quantitatively, whether effect of interfering substances can be eliminated, and whether it conforms to the laws of absorptimetry (Beer and Lambert's laws) upon which the necessary calculations are based.

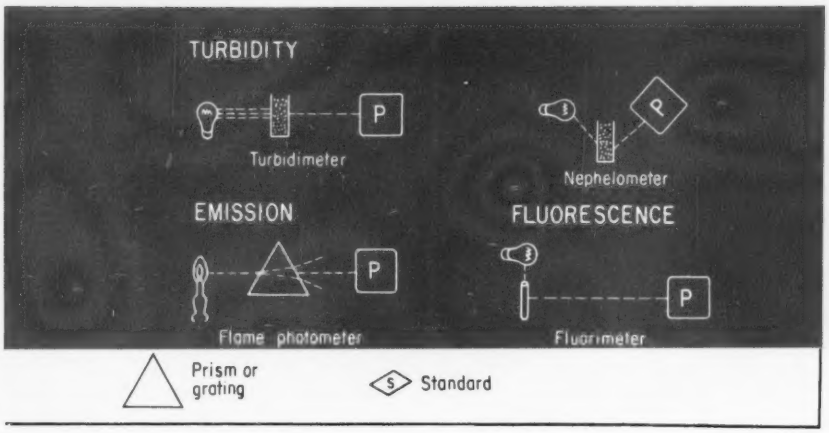
As a means of color specification, colorimetry represents the first step in establishment of a quality control system for product color. Additionally, it is an inspection tool for determining compliance with specifications set up within quality control or grade standards.

Eye Versus Instruments

Most common colorimetric instrument is, of course, the human eye. It is estimated that a trained person can distinguish between approximately ten million colors.[1] Several factors, however—departures from normal color vision; psychological influences, such as lighting, presentation of sample, and observer fatigue; and, perhaps most important, the comparatively poor acuity of one's color memory—render the human observer inadequate for many scientific tasks in this field.

Nevertheless, for many simple

* Concluding Part II, to appear in a forthcoming issue, will cover specification systems.



THE "HOW" of color-matching. For simplicity, instruments are divided into the following five categories: Transmission, reflection, emission, fluorescence, and turbidity.

Key to Quality Control

color matching purposes the human eye and judgment, used under carefully controlled conditions, can suffice. It can frequently produce more significant data than all but the most elaborate instrumental methods. This is especially true where measurement of color is apt to be affected by physical factors, such as sample heterogeneity, particle size, or surface effects.

Colorimetric instruments can be grouped into two classes: (A) Those for use in absorptimetric analysis, and (B) those intended for color specification and control. Many instruments, will serve both purposes, thus giving added utility. In addition, one usually is concerned with related instruments designed to measure other optical properties contributing to overall appearance.

While colorimetric tools are capable of being classified according to their functional properties, common names applied to many of them have overlapping nomenclature. For example, the term *colorimeter* is used in connection with numerous types of instruments and devices from simple comparators to elaborate photometers. For the sake of brevity, the following simplified and arbitrary nomenclature (also see lead illustration) has been adopted:

I. For Analysis

A. Units That Measure Transmission:

1. **Comparators,** such as are used for measuring pH are designed to hold tubes of samples and standards so as to permit visual color matching (Photo 1, p. 76). They give neither controlled illumination nor objective measurement. For many purposes they are, however, fully adequate. Oil colors may be measured, for instance, using the Wesson tintometer, a transmission comparator. (Data on this unit is given in tables).

2. **Visual Colorimeters** provide a refinement over the above comparators in that they include a built-in light source and/or filters, and/or a means of altering depth of solution being matched. The latter feature enables the analyst to determine concentration of an unknown solution by comparison with a standard solution, using Lambert's Law. This is the basis for the Dubosq-type colorimeter (Photo 2).

Dual-Purpose Unit

A visual instrument commonly used for both analysis and color specification of liquids is the Lovibond tintometer (Photo 3). It is a subtractive colorimeter—one in which the sample is matched against a colored field obtained by subtracting, by means of appropriate filter, various colors from a white light source. In an additive colorimeter, sample is matched by blending, in correct proportion, various colored lights.

3. **Photoelectric Colorimeters** eliminate the human error encountered with visual instruments, by replacing observer with a photoelectric cell (Photo 4). Units consist of a light source, colored filters (to permit desired colored light to be transmitted through sample), and a photoelectric cell connected to a galvanometer to determine amount of light transmitted (Photo 5).

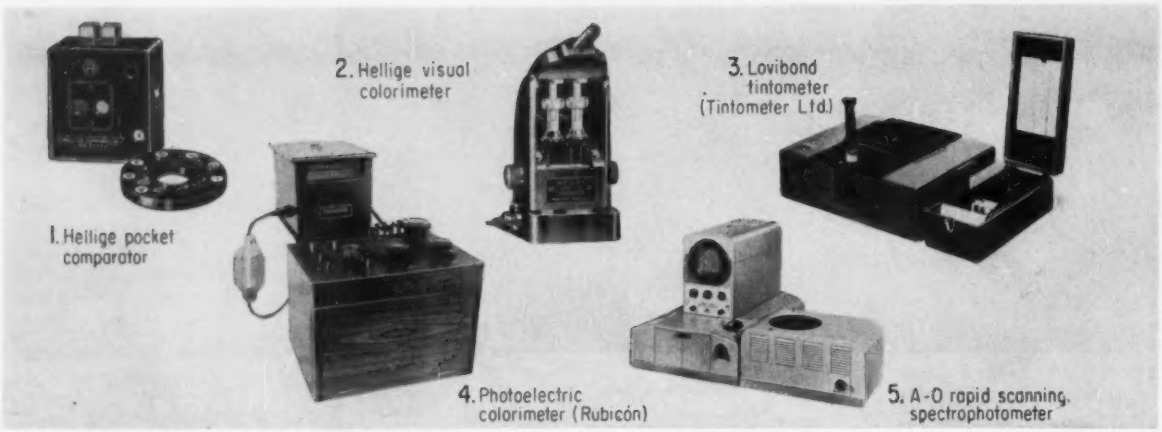
Instruments are usually standardized using a colorless blank solution. Concentration of unknown constituent in sample is determined by reference to a standard curve based on dilutions of known solutions. Colored chemical compounds behaving in accordance with Beer's Law exhibit a linear relationship between absorbence and concentration.

4. **Spectrophotometers.** When it is desirable to measure transmission of light of a certain wavelength, rather than that of a broad spectral band, a spectrophotometer, (photoelectric colorimeter) capable of isolating very narrow spectral bands is used.

White light that's emitted by its source is broken down into spectral colors by means of a prism or diffraction grating. By making suitable adjustments, light of desired wavelength is transmitted through the sample.

With such an instrument, it is possible to estimate not merely amount of light transmitted to any given wavelength, but also relative quantities transmitted (or absorbed) by the solution throughout the visible spectrum.

Based on this information, it is possible to draw a spectral transmission curve for a sample. Such a curve


1. Hellige pocket comparator
2. Hellige visual colorimeter
3. Lovibond tintometer (Tintometer Ltd.)
4. Photoelectric colorimeter (Rubicón)
5. A-O rapid scanning spectrophotometer

COLORIMETRIC INSTRUMENTS range from simple visual-matching devices to units equipped with attachments that auto-

may serve various useful purposes. It may: (1) Be used to determine location of characteristic absorption bands for particular compounds; (2) yield clues to their chemical nature; (3) reveal concentration of materials present (by reference to standard solutions); or (4) aid in deriving color specifications.

By substituting ultraviolet or infrared in light source of the spectrophotometer, one may obtain curves that are even more revealing of the chemical structure of the compounds. Many of these instruments are also equipped for, or adaptable to, other types of photometric measurement, such as flame photometry, reflectance spectrophotometry, nephelometry, fluorimetry, or flow colorimetry.

Recording Devices Help

An immensely valuable and labor-saving feature or accessory of some units is a recording device that automatically plots absorption versus wavelength (Photos 5-8). While spectrophotometers thus equipped are more costly than manually operated ones, the recording feature results in a significant economy in time of laboratory personnel.

B. **Units That Measure Emission.** Many elements when subjected to intense heat, such as an acetylene flame, convert some of this energy into light energy, with the result that characteristic emission spectra are produced. Most common example is the yellow light emitted by sodium when heated in a flame or by an electrical discharge.

As wavelength of light emission is characteristic of the element, and intensity of light is a function of quantity present, one may readily determine concentration of such an element in a solution. This is accomplished by atomizing solution into a flame and measuring (by means of a photoelectric cell) intensity of light at the characteristic wavelength. By reference to data obtained with solutions of known concentrations, one may calculate concentration of metal in the sample. This instrument is known as a flame photometer.

C. **Measuring Fluorescence.** A photometer in which solution is exposed to ultraviolet irradiation, and resulting visible light emitted by fluorescing compound is measured, is known as a fluorimeter or fluorometer. Several colorimeters or spectrophotometers on the market are adaptable to this type of color measurement.

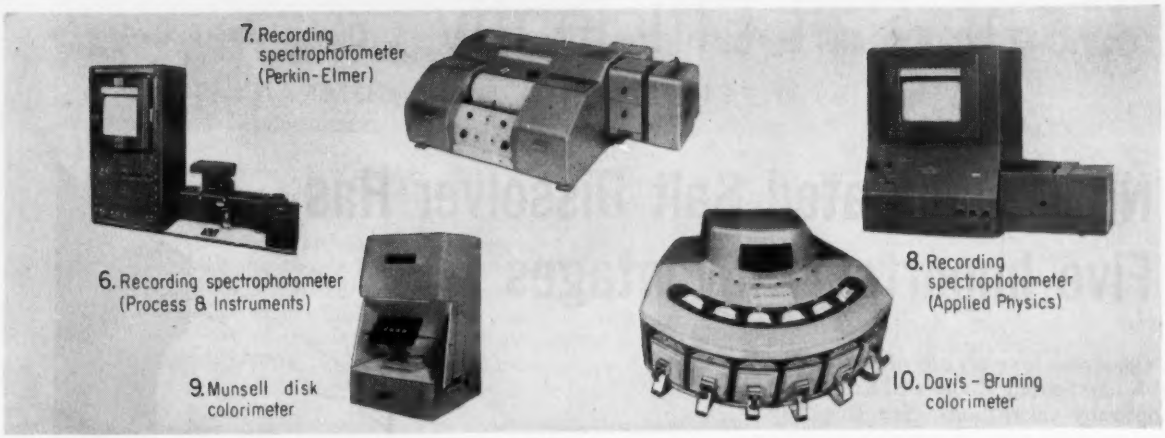
TABLE I — CHARACTERISTICS of Some Visible Range Spectrophotometers

Instruments and Makers	Monochromator Type	Recording	Wave Length Range (mu)	Can Be Used For*						
				Refl.	U.V.	I.R. Near	I.R. Far	Fluo.	Neph.	Flame Phot.
A. O. Rapid** Scanning	Prism	Yes	400-700	✓						
B. & L. Spectronic-20	Grating		340-950	✓						
Beckman-B	Glass Fery prism		320-1000	✓						✓
Beckman-DK (1 & 2)	Quartz prism	Yes	185-3500	✓	✓	✓		✓		✓
Beckman-DR**	Quartz prism	Yes	220-1000	✓	✓					
Beckman-DU	Quartz prism		220-1000	✓	✓			✓		✓
Cary —10	Quartz prism	Yes	210-800	✓	✓					
Cary —11	Quartz prism	Yes	200-800	✓	✓					
Cary —13	Quartz prism	Yes	210-800		✓					
Cary —14	Silica prism & grating	Yes	186-2600	✓	✓	✓				
Cenco-Sheard Spectrophotelometer	Grating		380-700							
Coleman —6A	Grating		400-700							
Coleman —14	Grating		325-800					✓	✓	✓
Fisher Color Analyzer	Prism	Yes	400-700	✓						
General Electric	Double prism	Yes	380-760	✓						
P. E. Spectracord —3000	Prism	Yes	210-2750		✓	✓		✓		✓
P. E. Spectracord —4000	Prism	Yes	200-2800		✓	✓		✓		✓
P. E. 13-U Universal	Silica & salt prisms	Yes	190-50,000		✓	✓	✓			
P. & L. RS-3	Quartz prism	Yes	210-750		✓					
Unicam SP-500	Quartz prism		200-1000	✓	✓			✓		
Unicam SP-600	Glass prism		360-1000							
Unicam SP-1400	Glass Fery prism		400-700							
Zeiss PMQ 11	Glass or quartz		200-2,500	✓	✓	✓		✓		✓

*Directly or with attachments available from manufacturer. **Discontinued models.

II. For Color Specification

Depending upon whether one wishes to specify color of a liquid or a solid, a transmission or reflection photometer would be used. To determine color of a liquid, a transmission comparator, visual colorimeter, photoelectric colorimeter, or spec-


7. Recording spectrophotometer (Perkin-Elmer)
6. Recording spectrophotometer (Process & Instruments)
8. Recording spectrophotometer (Applied Physics)
9. Munsell disk colorimeter
10. Davis - Bruning colorimeter

matically plot light absorption versus wavelength. Numbers link photos to descriptive text references.

trophotometer is required. For an opaque material, one of the following would be needed:

A. **Reflection Comparators,** which vary in complexity from the single paper or plastic color standards, used to grade certain fruits and vegetables, to the more versatile Maxwell disks. In the latter, various colors can be produced on a rotating sectored disk by varying the extent to which overlapping circular standards with a radial slit are exposed to view. A highly refined version is exemplified by the Macbeth-Munsell disk colorimeter (Photo 9).

B. **Visual Reflection Colorimeters,** which are designed to produce, by suitable mixture of colored primaries, a match for the sample being measured. Color can then be designated in terms of types and quantities of primaries required.

These instruments are mostly of the additives type, in which various colored lights are combined to perform the match. However, the colored lights might be obtained either by transmitting white light through filters (one filter for each color) as in the Guild, Wright, or Donaldson units, or by use of solid color standards. These are irradiated with white light to produce colored beams of reflected light, as in the Priest-Lange or the Davis Bruning colorimeter (Photo 10).

In either case, lights are projected into a viewing field permitting observer to vary colors until match is obtained. A subtractive type visual unit, designed by Judd, is known as the Chromaticity-Difference colorimeter.[2] Main weakness of all visual instruments is their reliance on ability of observer to achieve the proper match.

C. **Photoelectric Reflection Colorimeters,** which comprise a light source to illuminate sample, a photocell constructed to collect light reflected by sample at an angle calculated to obviate effects of specular (gloss) reflectance, and galvanometers, controls, etc., to permit measurement of light reflected.

Through use of special filters, it is possible to obtain reflectance data which enable one to specify color of sample according to systems such as the C.I.E., Hunter, etc. A number of colorimeters, particularly those of the trichromatic or tristimulus type, are equipped for both transmission and reflection measurements. They are, therefore, useful in obtaining color specifications on either solid or liquid foods.

D. **Spectral Reflectance Meters,** which usually are spectrophotometers that permit one to measure light reflectance by a sample throughout various wavelengths of the visible light spectrum.

By precise integration, it then is possible to determine, from these data, color designations according to trichromatic specification system such as the C.I.E.

III. For Measuring 'Opticals'

Overall appearance of a food product is frequently a result of more than merely its color. In the case of liquids, degree of turbidity or cloudiness is often a quality factor. In opaque products, gloss or luster may be of importance. These properties can be measured by the following instruments:

A. **Turbidimeters,** which determine extent to which transmitted light is blocked by suspended matter

TABLE II — TRISTIMULUS COLORIMETERS and Their Uses

Instruments and Makers	Suitable for		
	Transmission	Abridged Spectrophotometry	Gloss
Amer. Inst. Co. Polyfluorometer	✓	✓	
Inst. Del. Lab., Color Eye	✓	✓	
Mfg. Eng. & Equip., Colormaster	✓		
Zeiss Elrepho		✓	
Gardner, Auto. C.D.M.°	✓		✓
Gardner, Auto. gloss, color & reflect. recorder	✓		✓
Gardner. Auto. multipurpose reflect.	✓	✓	✓
Gardner, Auto. photometric unit	✓		✓
Gardner, High sensit. self-stand. auto. C.D.M.	✓		✓
Gardner, High sensit. manual stand. C.D.M.	✓		✓
Gardner, manual C.D.M.	✓		✓
Gardner, manual photometric unit	✓		✓
Gardner, multi-purpose reflect. meter	✓	✓	
Gardner, self-stand. large area C.D.M.			
Hilger & Watts, —J 20	✓	✓	
Hunter Lab., D-25, C.D.M.	✓		
Kaye, Trichrometer model 100	✓		
Kaye, Trichrometer model 300	✓		
Kaye, Trichrometer model 500	✓		
Macbeth-Ansco color densitometer	✓	✓	
Photovolt reflect. meter 610		✓	✓
Photovolt reflect. densitometer	✓	✓	

°C.D.M.—Color Difference Meter

Using Salt Efficiently

by INTERNATIONAL SALT COMPANY, INC.

New Evaporated Salt Dissolver Has Five Important Advantages

Here's good news for every user of evaporated salt brine! A new Sterling Evaporated Salt Dissolver developed by International Salt Company is available in a full range of capacities to suit special plant requirements. The equipment features an exclusive new hopper, a float chamber with hydrostatic head, tough plastic construction, and by far the highest flow ratings yet achieved in dissolvers of similar size.

1. New custom designs. The Sterling Evaporated Salt Dissolver is available in standard sizes of 30″, 36″, 48″ and 60″ diameter, and in larger sizes to meet custom requirements. International also offers plans for converting existing tanks or other plant equipment into salt dissolver service.

2. Exclusive new hopper. The Sterling Evaporated Salt Dissolver's remarkable new hopper insures free salt flow, even under high-humidity conditions. Besides increasing salt storage space, the hopper permits adding salt without lowering the liquid level in the dissolver—a valuable timesaver.

3. Precision-engineered float chamber. Unique system* prevents undissolved salt crystals or brine in the dissolver itself from flowing up into the float chamber. Resulting "one-way traffic" eliminates salt recrystallization, which could otherwise impede the free action of the float valve.

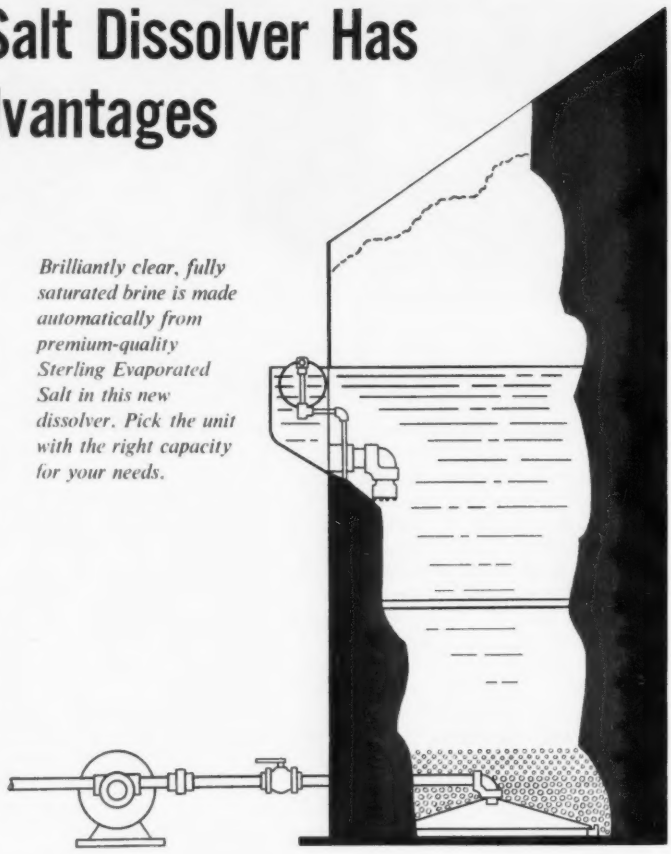
4. Corrosion-proof plastic used in the new dissolver is acceptable to the Food and Drug Administration of the U.S. Department of Health, Education and Welfare and to the Meat Inspection Division, U.S. Department of Agriculture, for use in food processing equipment.

5. High capacity. In-plant performance has already proved over and over that the new standard 36″ x 48″ Sterling Evaporated Salt Dissolver will deliver in excess of 900 to 1,200 gallons of saturated brine per hour. The only limiting factors are the capacity of the pump and provisions for adding salt to the dissolver.

If you'd like engineering help in deciding on the best Sterling Evaporated Salt Dissolver for your specific needs, contact International Salt Company. An expert Sterling sales engineer will gladly work with you or your plant engineer to determine the right dissolver capacity and location, functional piping layouts, etc.

*PATENTS PENDING

Brilliantly clear, fully saturated brine is made automatically from premium-quality Sterling Evaporated Salt in this new dissolver. Pick the unit with the right capacity for your needs.



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From 50 years' field experience and a continuing research and development program (the first ever established in the salt industry), International has accumulated an unequaled amount of technical data on salt—its production, properties and uses. Our engineers will be glad to make this information available to you without charge. They can also help you select the right salt for your needs—from the complete line of high-quality Sterling Rock and Evaporated Salt. Contact your nearest International Salt Company sales office, or write to us direct.

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Service and research are the extras in

STERLING SALT

INTERNATIONAL SALT COMPANY, INC.

that constitutes cloudiness. Most colorimeters and spectrophotometers can be employed for this purpose if proper procedures are used to insure that the measurement is of turbidity rather than of light absorbency due to color.

B. **Nephelometers,** which are specialized instruments designed for turbidity measurements. The light measured is not that which is transmitted through the sample but instead that which is reflected by particles suspended in it. Thus, total quantity of light reflected is a measure of suspended matter. In bacteriological work this is often a convenient way of counting microorganisms in a liquid medium.

C. **Gloss Meters,** which measure light reflected from the samples at angles greater than 45 deg. to the incident beam. At these wider angles, light is reflected in proportion to glossiness of sample rather than to brightness of its color. Several color-measuring reflection meters are adaptable, through use of different sensing heads, to measurement of specular (gloss) reflectance.

A gloss meter capable of measuring, with a single head, specular reflectance at variable angles of illumination is known as a "goniophotometer."

References

1. Kelly, K. L. and Judd, D. B., "The ISCC-NBS Method of Designating Colors, and a Dictionary of Color Names." Nat'l Bur. Stand. Circ. 553, 1955.
2. Judd, D. B., *Color in Business, Science and Industry*, John Wiley & Sons, N. Y. City, 1952.

Above report is Contribution No. 1157, University of Massachusetts, College of Agriculture Experiment Station.

What's Behind Colors

Food colors, as considered here, are due to pigments (natural colorants of vegetable or animal products) or to dyes (natural or artificial agents added to enhance appeal of products).

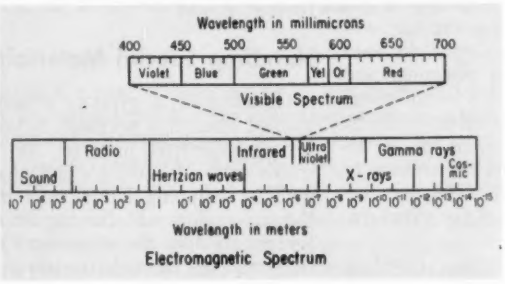
Pigments of a particular class do not necessarily possess the same color. For example, lycopene, the principal pigment of tomatoes, is red not orange, although it belongs to the carotenoid family. Anthocyanins may be colorless (leuco) or blue as well as red. Chlorophyllaceous products usually also contain appreciable carotenoid pigments, both being found in the cells in units known as chloroplasts.

Also, there is a chemical similarity between chlorophyll and carotenoids on the one hand (phytyl portion of chlorophyll molecule resembles carotenoids in structure) and between chlorophyll and hemoglobin on the other hand (both have complicated porphyrin structure).

Most artificial colorants, as well as all of the natural ones, are organic in nature. Use of inorganic substances, ordinarily materials of mineral origin (also termed pigments), is no longer common.

Physical Aspects

When light falls on a food product, a portion of this light is absorbed. Remainder is reflected or transmitted, depending upon opacity of the product. If observer is so positioned that only the light passing through the product can reach him, the color he observes will be due to those portions in the visible spectrum (see drawing) which are being transmitted.



If, on the other hand, only light reflected off the surface can reach him, the color must be attributed to that portion thrown back from the product.

Such products as juices, syrup, jellies, or preserves both transmit and reflect portions of the light falling upon them. Since light absorbed is the same in any one case, resulting color will remain the same regardless of whether it is viewed by transmission, reflection, or a combination of both.

A tomato appears red because the violet, blue, and green portions of the visible light are absorbed by its pigments, leaving the red and orange and, to a lesser extent, the yellow light to be reflected. Grape juice appears purple because its pigments transmit primarily light in the violet, blue, and red regions of the spectrum.

Just as colored pigments may be blended in various proportions to produce intermediate hues, so two lights of different colors, may be superimposed upon one another to give colors or hues different from those used to produce the mixture. For example, if yellow and blue light of equal intensity are blended, resulting effect will be a green light.

If, however, intensity of the yellow light is greater than that of the blue, resulting color will be a yellow—green. And if intensity of the blue is greater than that of the yellow, a bluish green will be produced.

Thus, color of a food results not only from the hues, but also from the relative intensities of lights not absorbed by the pigments.

Non-spectral colors can also be explained in this manner. White is due to all the light being reflected. Black results from all the light being absorbed. Grey is due to partial absorption and partial reflection, the two levels being constant over the entire range of visible spectral colors. Brown results from absorption in the violet and blue regions, with gradually increasing reflection in the other regions with increasing wavelengths of the light.

Effects of Combinations

Additive and subtractive effects of color combinations need to be kept clearly in mind. When lights of various colors are superimposed upon one another, as by projecting them upon a white screen, color seen will be the result of the sum of the different ones present.

It is possible, by using at least three appropriate light sources in the correct proportion, to produce white light. On the other hand, if various lights are removed from a white source by interposing colored filters between lamp and screen, there may finally be a total elimination of light.

A similar effect is obtained when various pigments are combined and applied to a surface. Since each one selectively absorbs a portion of the visible spectrum, a combination may absorb throughout the entire spectrum and no light will be reflected. Three primaries, such as blue, green, and red, are sufficient to simulate any desired color.

Lights of wavelengths other than those contained by the visible portion of the spectrum are also important to food scientists. Those in the ultraviolet and infrared regions are extremely useful in qualitative and quantitative analysis of food constituents.

Many compounds, for example the B vitamins, thiamin and riboflavin, absorb energy in the ultraviolet area of the spectrum and there is a visible emission. This phenomenon, known as fluorescence constitutes the basis for fluorimetric analysis, since quantity of light produced is directly related to concentration of substance present.

Substances which merely absorb ultraviolet light without transforming it into visible light can frequently be analyzed by using a spectrophotometer equipped with an ultraviolet light source and photoelectric cell sensitive to this light. This absorption is due to presence of various types of chemical bonds within the molecules of the compounds.

Infrared analysis is, therefore, a useful tool for studying structure of organic compounds, since absorption bands obtained serve to identify component parts of the molecules.

For free reprint of this article, write I-3 on Reader Service Card, back of issue

QUICK AND SIMPLE disassembly is accented in modern gyratory screeners. Thus, cleaning and changes of screen cloths are easy. Here we see fit-up of six-deck model used by leading baker for handling either flour or sugar.

Getting Better Screening

Take these pointed tips on modern gyratory sifting . . . An expert's close focus on: Pilot testing, blinding, seals, structural components, screen life, special feed materials

PROPERLY APPLIED, gyratory screens offer the most effective means of separating dry, free flowing, granular material in mesh sizes ranging from 4 to 325.

Experience proves that efficiencies can run to 97%.

Getting best results calls for careful check of all factors. Key to high performance is simulation of plant operating conditions to pre-determine proper screen application. Basic in this piloting is the laboratory penetration-rate test, requiring only a 14x14-in. experimental sifter (Allis-Chalmers), plus a complete set of commonly used bolting cloths, a balance, and a stopwatch.

The experimental sifter is covered with a screen cloth having the designated apertures. Then flow through the sieve of a 500g. test sample of stock is observed and timed by stopwatch. Through-product is weighed and rate of penetration (lb. per min. per sq. ft.) is conveniently calculated.

Since available screen surface of the 14x14-in. sieves approximates 1 sq. ft., feed-rate equivalent is quickly figured in lb. per min. by multiplying 1.1 lb. (500 g.) by 60 and dividing by the timed interval in seconds as determined by stopwatch.

LIONEL MOORE

Chemical Processing & Food Machinery Section, Allis-Chalmers Mfg. Co., Milwaukee

Minimizing Plug-Ups

In conjunction with this test, visual observation of condition of the screen cloth following the test will determine to what degree (if any) there is blinding or plugging, and the probable cause. A metal plate, so placed that the sifter-discharge product impinges upon it, is attached to a calibrated electroscope to determine potential difference between the ground and the sifted materials.

Electrostatic charges (abetting blinding) are minimized by grounding the screen, discharge pan, and frames of the gyratory screen.

Mechanical blinding is usually attributed to undesirable particle size, extra heavy layer of stock on screen cloth, or insufficient ball-cleaner action. Where possible, substitution of silk or Nylon for metal screens may stop mechanical blinding. Too, increasing the number of rubber balls per bay under screen cloths may improve cleaner action.

Points on Seals

Isolation of the various screened products within the gyratory screen is accomplished through seals: Machinery plush in screens of wood construction and compressive materials in those of all-metal construction (magnesium alloy or stainless steel).

All-metal screens can be furnished with seals of crude rubber, Neoprene, Buna "N", and silicone. For oil-free applications below 200 deg. F., crude rubber is best suited. Where essential oils of screened material would have a deteriorating effect on natural rubber, seals of Neoprene or Buna "N" (limited to feed temperatures below 200F.) give best results.

With oily grains and spices, it is often wise to consider wood construction, since machinery plush has great resistance to essential oils.

All applications in the 200-400F. range require the all-metal gyratory screens with silicone seals.

In the 300-400F. range, it is best to consider the stainless steel gyratory screen over the magnesium model. Reason: Because of the difference in coefficients of expansion between screen cloths of magnesium alloy and those of standard metal (Monel, mild steel, or stainless steel), there is a tendency toward a loosening and free slapping of the cloth on the insert. As a result, the efficient gyratory action is converted into a combination horizontal and vertical motion, adverse to efficient separation and normal screen-cloth life.

Handling Special Materials

Occasionally, a gyratory screen is applied where it is necessary to break up agglomerated material on the screen cloth. Installing a jack chain, with its whipping action, on top of the screen cloth will disintegrate soft lumps and allow the component particles to pass through the apertures of the screen cloth. Naturally, however, this will greatly shorten screen-cloth life.

When materials of extreme abrasiveness are being separated in a gyratory screen, it is best to prevent the feed from falling freely on the top screen cloth, either by deflecting it in the inlet spout or by covering the head half of the cloth with a piece of sheet metal. —*End*

LOOK *for new ways to prevent spoilage*

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FEATURES OF TAMED IODINE AGAINST OTHER TYPES OF DISINFECTANTS			WELADYNE
	Chlorines	Quats	
Microbial Activity	Very short	Variable	High
Stability	No	Yes	Yes
Cost in Use	Low, but require frequent application.	High	Very low.
Odor	Heavy and penetrating.	None	Very light and non-lingering.
Cleaning Ability	None, cause bleaching.	Poor, inactivated by soaps.	Good
Microbiology	Selective germicide. Will not destroy a wide range of organisms.	Selective germicide. Will not destroy a wide range of organisms.	A nonselective germicide. Kills bacteria, virus, molds, fungi, yeast, spores, etc.
Affected by Hard Water	No	Yes	No
Indicator of Bacterial Efficiency	None	None	Color
Effect on skin, full strength	Irritants	Sensitizers	Nonirritating
Toxicity	Yes	Variable	No

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WELADYNE offers greater germicidal capacity than other germicides. As shown by tests on common pathogens. It is quick acting, long lasting. Destroys bacteria that cause odors and spoilage. Inhibits their reformation without residual carry-over of odor or flavor.

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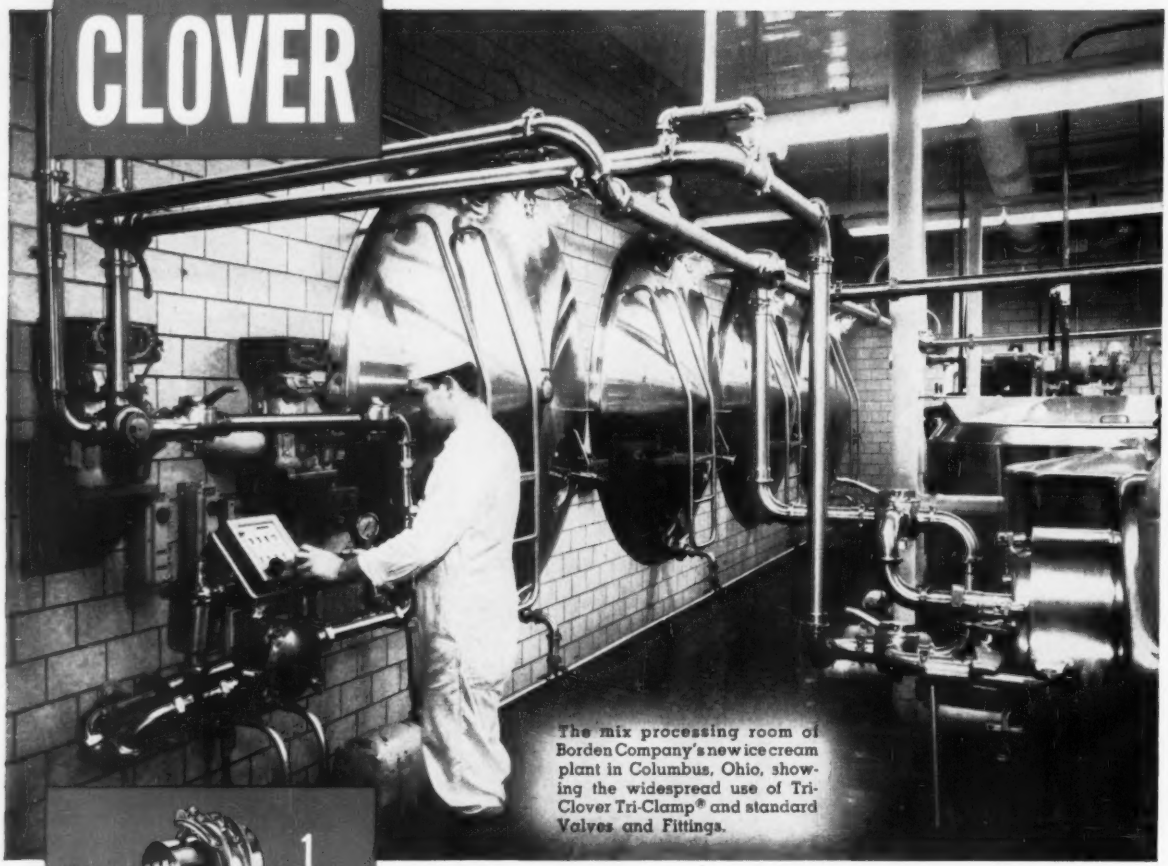
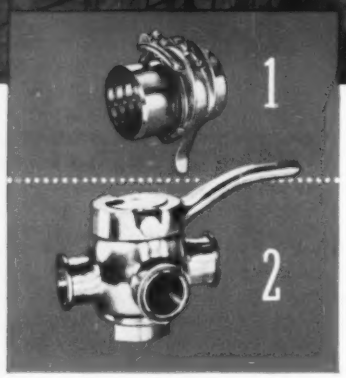


The mix processing room of Borden Company's new ice cream plant in Columbus, Ohio, showing the widespread use of Tri-Clover Tri-Clamp® and standard Valves and Fittings.



1 TRI-CLAMP Snap-Action Spring Clamps offer greater speed in assembling and disassembling a positive, leak-tight joint, plus substantial savings in original investment cost.

2 TRI-CLAMP Lift Type Valves. Exclusive "cam action" of the handle provides a positive lifting and "cracking" action on the plug by working against the spring steel plate below the valve body.

This scene in the Borden Company's new 2-million gallon ice cream plant is a typical example of how large and small plants everywhere are turning to Tri-Clover Division products to guard against contamination that could destroy the delicate flavor and purity of the finished product. Ice cream producers have found that Tri-Clover's sparkling clean Tri-Clamp and Standard Stainless Steel Valves and Fittings combine the highest degree of corrosion-resistance and sanitation with the labor-saving ease of cleaning that helps reduce processing costs.

Our engineering staff, backed by many years of practical experience and specialized knowledge in completely sanitary handling of milk products, liquid sugars, syrups and other liquid products, will gladly help you solve your processing problems. *Write for Catalog 1-154 or see your nearest TRI-CLOVER DISTRIBUTOR.*

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Heat Resisting Chocolate

Addition of completely hydrogenated fats to sweet chocolate prevents softening in hot weather, yet does not affect mouthing qualities.

However, this modification increases viscosity making it impossible to apply a thin coating of the chocolate to confections with commercial enrobing equipment. Addition of emulsifiers did not improve quality.

Experiments were conducted in an attempt to find suitable additives that would not impair eating quality, yet give rigidity to the chocolate mass and retard fat leakage at temperatures above softening point of cocoa fat.

Included were hydogenated cottonseed and cocoa oils, dextrins, starch, natural gums, protein preparations, fatty acids, fatty acid esters of sugars, different glycerides and emulsifiers. Completely hydrogenated fats performed best.

Therefore, hydrogenated cottonseed oil (2-20% of cocoa butter) was mixed into sweet chocolate at 142F. followed by conventional tempering, and molding into bars.

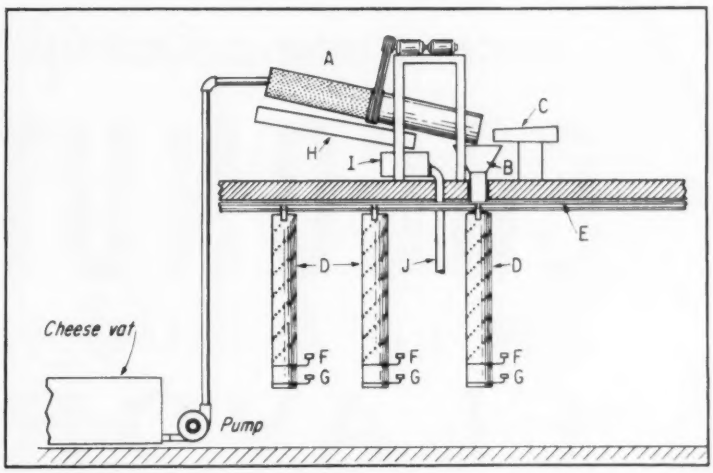
Products with less than 10% hard fat had good mouthing qualities, and those below 5% level were indistinguishable from control. Gloss was similar to control. Fat leakage at 97F. was retarded.—*J. Amer. Oil Ch. Soc.*, 4-8, Jan. 1959.

Plastic Coated Foods

Methods and materials for applying a tightly-adhering, transparent, flexible protective coating to meats and meat products that will remain tough at −20F. or lower, yet can be readily peeled from the article, are objects of a recent patent.

Coatings comprise mixtures of ethyl cellulose, oleaginous constituents, plasticizer, antioxidant and nontoxic color stabilizer. Mixture is applied hot by dipping or spraying fully or partly frozen meat cuts, or to smoked or cured meats, fish and fowl in unfrozen condition.

Thickness of coating (from 10-100 mils) and appearance are controlled by varying proportions or types of materials in the mixture, and by varying coating techniques.—U. S. Patent 2,868,656, Jan. 13, 1959.



Continuous, Automatic Salting of Curd Features New Cheese Process

A semi-automatic cheesemaking process in which the conventional milling and salting steps are eliminated, and apparatus for carrying it out are subjects of a recent patent.

Process retains customary setting of milk, cutting and cooking of curds in standard vats. Mixture of curds and whey is pumped from vat to revolving drum (A in drawing) first section of which is perforated to drain off the whey. As curds are discharged from end of drum, they fall into a funnel-shaped receptacle (B). Here they are salted continuously by means of a vibrator-feeder (C).

Mixture of curds and salt fall from funnel into perforated forming tubes (D) where they are retained until a cohesive body develops A number of these tubes are suspended on circular monorail (E) for easy movement under funnel (B) for filling, and to enable adequate storage capacity for curd during the knitting process. Perforations permit drainage of whey.

Each tube has two cheese-supporting cut-off knives (F and G) in its lower end separated by a distance approximating height of cheese hoops. When filling tubes, knife (G) is usually in the cut-off position and (F) swung away from tube. When curd has knit sufficiently, knife (F) is pushed through the column, cutting off an increment the size of a hoop. Knife (G) is swung out allowing increment to be removed and placed in dressed hoop. Then (G) is swung back and (F) removed to allow curd column to slide down onto (G). Procedure is repeated until entire column is hooped. Dressed hoops are then pressed conventionally.

Whey from perforated revolving section of drum is caught in trough (H) which empties into tank (I). It is removed through pipe (J).—U. S. Patent 2,868,651, Jan. 13, 1959.

Improving Gorgonzola

Results of recent Czechoslovak experiments show that yield and quality of Gorgonzola cheese may be improved by using a mixture of skim milk and homogenized cream.

In the method, milk was separated to 20% fat cream, the cream homogenized at 3,000 psi. and recombined with the skim to form milk testing 3.4-3.7% fat. This milk was pasteurized, coagulated, the curd aged overnight, and in the morning filled into molds together with fresh curd as in the conventional method.

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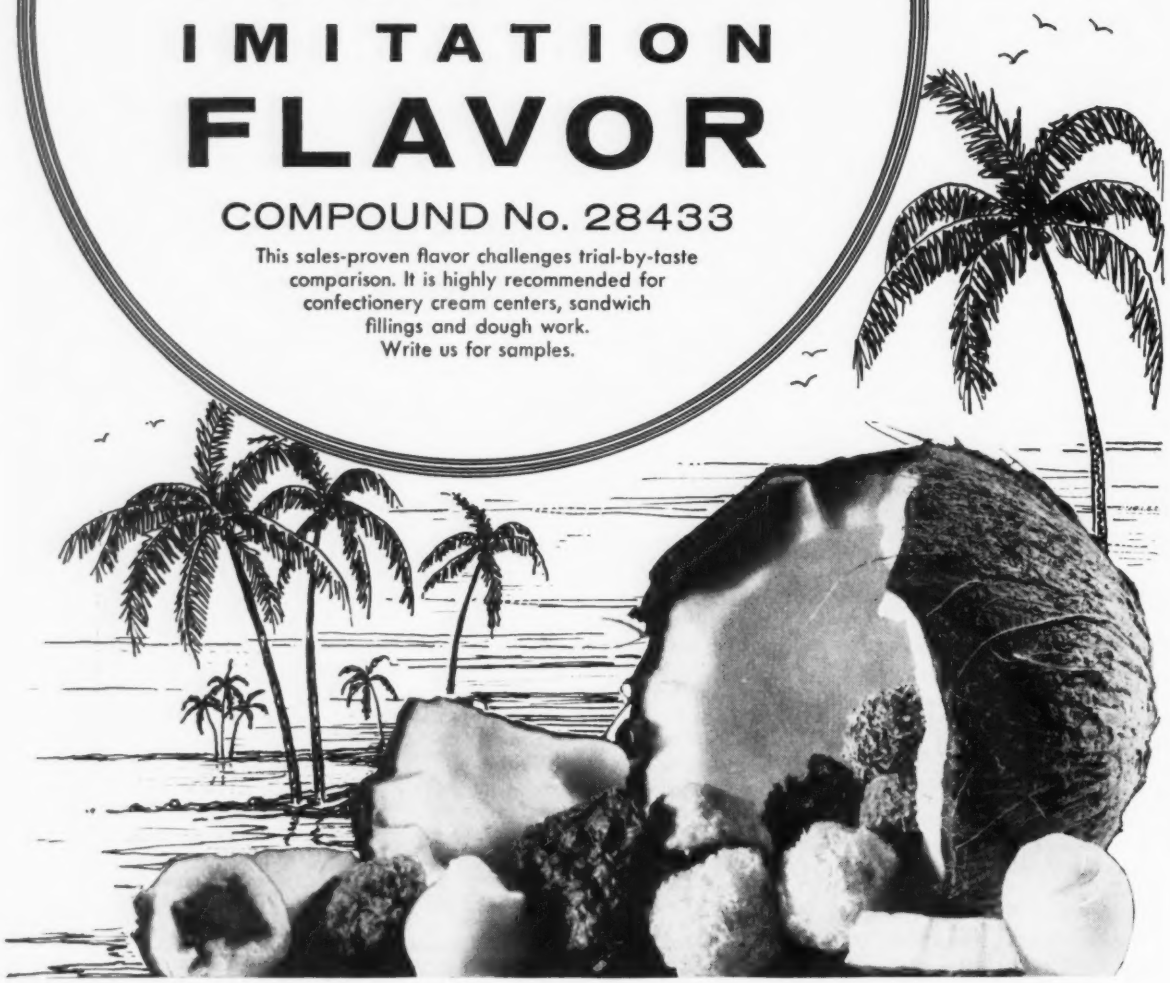

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Ratio of aged to fresh curd was 2:3. A cylinder was placed in the mold to insure that the aged curd remained in the center of the cheese. Ripening was normal and on grading at maturity the cheese had a well developed, characteristic flavor, a fine consistency, and was spreadable. It was given an average score of 94 out of a possible 100 points.

About 7.9 l. of the milk were required to produce 1 kg. of cheese as compared with 8.26 l. by the conventional method.—*Zprávy Vyzkum Ust. Mleko a Vejce*, No. 3-4, 55-84. 1957. (In Czech).

Quality of Frozen Fish Checked by Solubility

Solubility of fish muscle in ice-cold 5% NaCl solution, has been proposed as an indicator of degree of deterioration of frozen fish during storage.

Solubility of cod muscle was found to vary with size of fish, its state of nutrition, and part of the fillet from which sample (1.0-1.4 g.) is taken. More consistent results are obtained if muscle fibers (myotomes) are dissected free of separating septa (myocommata) since the latter have a low soluble nitrogen content.

Soluble protein of the myotomes decreases steadily in frozen cod fillets stored at 7F., from about 70 to 30% in 15 weeks, then remains constant up to 4 yr. Freezing rates do not affect these results.

For storage temperatures around −22 F., the index is unreliable. It is also inaccurate for big fish, or fish caught from December to March.—*J. Sc. Food & Agr.*, 9(9), 597-617. 1958.

Heating During Processing Cuts Life of Oat Cereals

Shelf life of fully gelatinized, oat flakes and other ready-to-eat oat breakfast cereals is considerably shorter that that of uncooked groats or oatmeals.

Fat content (4½-11%, mainly unsaturated) is higher than in other cereals, making oat products more liable to oxidative type of rancidity. Oat oil in unheated oatmeal is highly resistant to oxidation, while oatmeals given a severe heat treatment (drying at 365F.) developed rancidity in 10-14 days.

Low moisture (about 1%) favors rancidity; moisture around 10% is more favorable to fat stability. Enzymes that stimulate rancidity and browning reactions are present in the

TENNANT Industry's most complete line of POWER SWEEPERS

TENNANT Model 40 Sweeper

HERE IS America's most complete and widely used line of power sweepers . . . for plants of all sizes.

If your plant is not already using a TENNANT Sweeper, you'll be surprised at its performance . . . and the savings it can bring you.

FOR CONGESTED AREAS—A compact NEW walk-behind Sweeper (Model 40). Cleans 32″ path, turns in its own tracks. *Equals "big sweeper" performance for* CLEAN *sweeping!* Sweeps 8 to 20,000 sq. ft. per hour in most plants . . . or 2 to 5 times faster than a man with a broom. Very powerful brush-and-vacuum system: out-performs any other sweeper of its size for clean, dust-free work. Low priced.

FOR SMALL PLANTS — Versatile space-saving Sweeper (Model 50) cleans 40″ path on the run. Travels at 1½ to 8 mph, *sweeping 3 to 7 times faster than is possible by hand.* Rider-type; easy to use. Combined brush and vacuum system instantly removes chips, sand, debris, dirt and dust that pushbrooms can't pick up.

Compact design and easy steering make the "50" ideal for both congested and open areas. Often pays for itself in 9 to 14 months. Gas or LP-gas models.

TENNANT Model 50 Sweeper

TENNANT Model 80

FOR HEAVY DUTY SWEEPING—The superbly engineered Model 80 is *industry's choice for rugged, 'round-the-clock sweeping.* Has no equal for performance. Cleans 53″ path. Sweeps up to 110,000 sq. ft. per hour in open areas, yet is "aisle-designed" to operate efficiently in aisles as narrow as 5 ft.

Easy to operate: starts, stops, reverses instantly. Dirt hopper holds up to 800 lbs., dumps hydraulically in 10 seconds. Gas or LP-gas models; similar electric powered model available.

FOR MAXIMUM CAPACITY, here is the giant Model 100. *Has 3 to 4 times the capacity of smaller sweepers.* Cleans 7′ 4″ path, yet has turning radius of only 9′ 2″. Hydraulic dump hopper holds almost 2 yards.

Excellent dust control and huge capacity make it ideal for yards, docks, salvage work, large aisles, etc. Nothing else like it!

Write today *for illustrated bulletins on Tennant Power Sweepers. Get details on how to reduce your sweeping costs.*

TENNANT Model 100 Sweeper

G. H. TENNANT COMPANY, 767C N. Lilac Drive, Minneapolis 22, Minnesota

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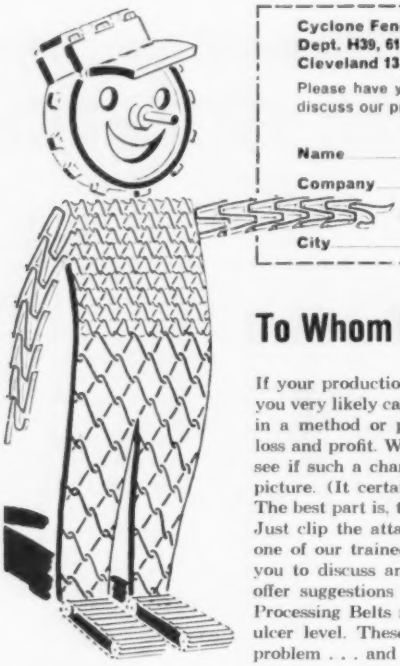

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To Whom **money** May Concern:

If your production costs are higher than they ought to be, you very likely can do something about it. Often one change in a method or process can make the difference between loss and profit. We'd like a chance to consult with you and see if such a change in method won't improve *your* profit picture. (It certainly has paid off for many other firms). The best part is, that it won't cost you one cent to find out. Just clip the attached coupon and mail it. When you do, one of our trained conveyor belt representatives will visit you to discuss and examine your particular problem and offer suggestions that will show you how Cyclone Metal Processing Belts may cut your production costs below the ulcer level. These suggestions will be tailored to YOUR problem . . . and no obligation. How can you lose? Do it today. *USS and Cyclone are registered trademarks*

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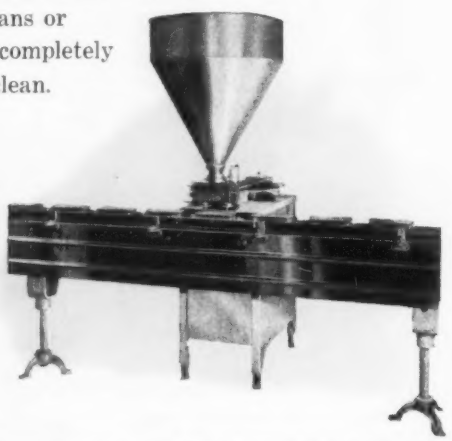
For inexpensive filling . . .

the SIMPLEX TWIN

Top efficiency with this fully automatic Simplex Model T. A universal machine to handle cartons, cans or jars. No can no fill, completely adjustable, easy to clean.



Fills 25 to 80 containers per minute! Range from 2 oz to a gallon! Handles liquids and semi-solids!

Write for circular on this 2-piston model and other Simplex fillers. Dept. FE.

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Advances in Technology

groats, but their effects can be avoided to some extent by a 3-min. steam treatment. Excessive steam cooking, however, reduces fat stability.

Enzyme-inactive groats are somewhat more stable but lose their stability when heated to 365F. Husk particles added to the groats stimulate rancidity development, apparently because of lipases present.—*J. Sc. Food & Agr.*, 9(12), 817-24, 1958.

B-Lysolecithin Now Seen As Source of Beer Foam

A crystalline compound beta-lysolecithin, isolated from beer wort before addition of hops, has remarkable foaming power and could be the agent that builds the head on a glass of beer.

On hydrolysis it yields one molecule each of palmitic acid, beta-glycerophosphoric acid, and choline base. B-lysolecithin crystalizes in colorless needles, which are neutral, odorless, but of slightly acrid bitter taste. It is slightly hygroscopic, soluble in water, alcohol (methyl or ethyl), and chloroform.

In either water or dilute alcohol (4-8%), b-lysolecithin produces a persistant foam that does not collapse in 3 hr. or more. Even in 0.001-0.01% solutions it produces a sharp drop in surface tension from 71.5 dynes (water) to about 38 dynes, and these solutions yield stable foams.—*Bul. Brewing Science (Japan)*, Vol. 4, 1958, (34 pages in German). *Scientific Research Institute, 247 Mita, Meguro-ku, Tokyo, Japan.*

Preventing Chill Haze

Treating essentially clear beverages such as beer to eliminate ingredients responsible for chill haze is the subject of two recent patents.

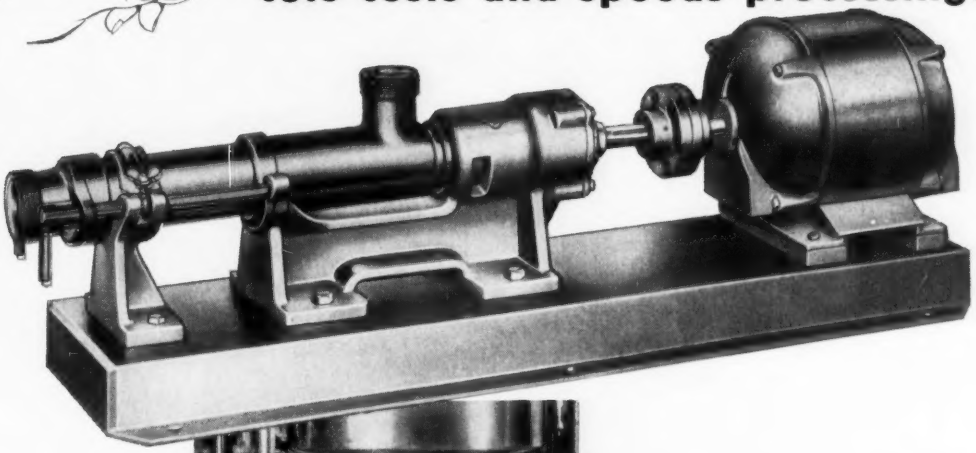
Processes comprise adding to the beverage at below 40F. minor quantities of polymer or copolymer coagulating and precipitating agents, then heating to above 40F. to coagulate and ppt. haze-producing ingredients and added coagulant. This is followed by separation of ppt. from clarified beverage.

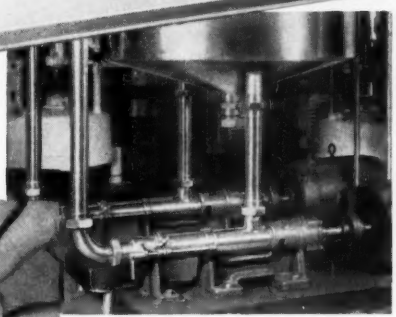
Added coagulants may be the polymer N-vinyl-5-ethyl-2-oxazolidinone, or a copolymer comprised of above polymer and N-vinyl-5-methyl-2-oxazolidinone.—U. S. Patents 2,872,321 & 22, Feb. 8, 1959.

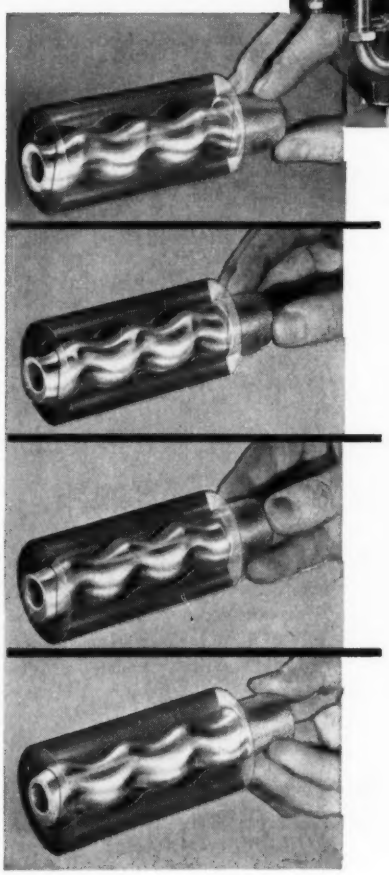
Quick cleaning

MOYNO® FOOD PUMP

cuts costs and speeds processing!







"Progressing cavity" principle . . . pumps everything from hamburger to potato salad!

With simply-designed Moynos pumping your food products, workers formerly assigned to long, costly pump cleanups can be used for other tasks! The entire Moyno unit can be quickly dismantled for thorough, effective cleaning and re-assembled in minutes. Moynos are more sanitary on the job, too. Pumping element has smooth contours which can't lodge particles where bacteria might thrive. Bearings are isolated from pumping compartment to prevent contamination by lubricant.

Moynos operate on the "progressing cavity" principle, illustrated at left. The screw-like, reversible rotor revolves in a double threaded stator, creating the progressing cavities. Material moves smoothly along, without pulsation, aeration, agitation, disintegration or contamination! All wettable parts, except stator, are stainless steel. Stator may be stainless steel, synthetic rubber, odorless bakelite or other material—depending on service. Any food product that will move through a pipe can be pumped with a Moyno—even lumpy ones like fruit cake mix!

Learn more about Moyno—the quick-to-clean pump that food can't stump. Write today for Bulletin 30-FE!

ROBBINS & MYERS, INC.

SPRINGFIELD, OHIO / BRANTFORD, ONTARIO

R&M

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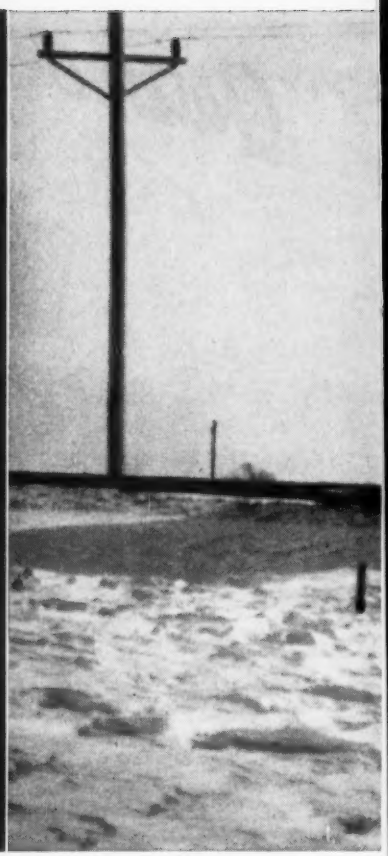
Chevy power is tough—

and proves it on high-tonnage north country grind!



This hauler had 104,000 miles on his Chevy heavy-duty V8 before even a valve job was needed! William Brosius of Grand Forks, N.D., works his Chevrolet Series 100 models hard, all year round. Summers, they pull 10-yard boxes for hauling sand and gravel. The rest of the year, in all kinds of north country weather, they pull tandem trailers with full-capacity loads of potatoes or grain. "They keep at it all the time," Bill Brosius says. "One of them even covered 104,000 miles before a wrench ever touched the engine to take off the heads or pan."

That's a *tough* truck job—but there's a big 348-cu.-in. Workmaster V8 under the hood of that 10203 Chevrolet shown above, delivering the kind of durable power that's rating it tops for efficiency on rugged runs. A Spicer 5-speed transmission and an Eaton 18,000-lb. 2-speed rear axle round out a dependable power team.

In less than a year, this heavyweight model (which also features frame reinforcements, cast-spoke wheels and heavy-duty springs) has covered over 120,000 miles! Tough-built big-truck components make Chevrolet's new heavyweights or middleweights the best trucks yet for your long hard hauls!

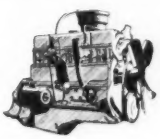
No job's too tough for a

Chevy's powered to cut costs and keep going on your long, hard hauls!

That's for *sure*, whether you use mighty middleweights or high-capacity heavyweights—whether you prefer V8's or 6's.

Take Chevrolet's 1959 big-truck V8's, for example. As indicated by that tough truck job pictured above, these modern engines are out to whip any work that comes their way. They've got what it takes to do it. The *shortest piston stroke* of any comparable truck V8's: a sure sign of more work on less fuel. Compact design that cuts down on truck weight and helps assure the biggest possible payloads. Scores of up-to-the-minute features that know how to trim overhead: full-flow oil filter, hydraulic valve lifters, hard-faced exhaust valves and hardened valve seats, extreme-duty Moraine 400 bearings, rotor-controlled governor, overspeed warning light, and many more.

And with a *complete* lineup of modern V8 powerplants—including 160-h.p. Trademaster, 160-h.p. HD Taskmaster, 175-h.p. HD Super Taskmaster, 185-h.p. Workmaster Special and 230-h.p. Workmaster—Chevy can match the engine to your work, ideally.



Or if you prefer 6's, Chevy's *still* your best bet. Standard in Series 40 models is the 135-h.p. Thriftmaster 6, better than ever for '59 with a new Economy-Contoured camshaft that improves gas economy by 10%! And in series 60 there's a new edition of the 150-h.p. Jobmaster 6. It offers new durability stemming from new tougher built pistons, Stellite-faced exhaust valves and chrome-plated oil control rings. Both of these famous 6's provide plenty of hard-pulling torque.

Six or V8, you'll go a long way before you see the likes of this '59 Chevy engine lineup. Actually, there's only one *best place* to go for all your trucking needs—and that's to your Chevrolet dealer's. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

Chevrolet truck! CHEVROLET

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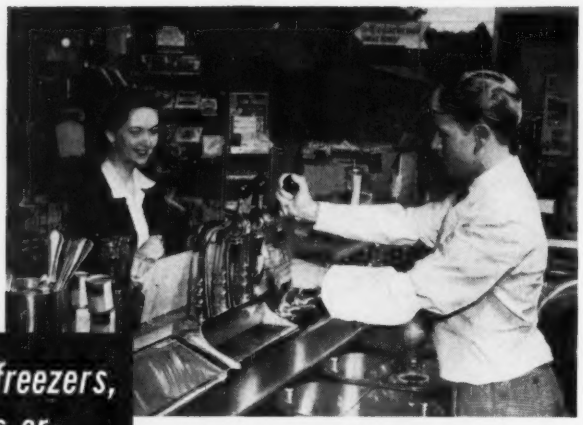
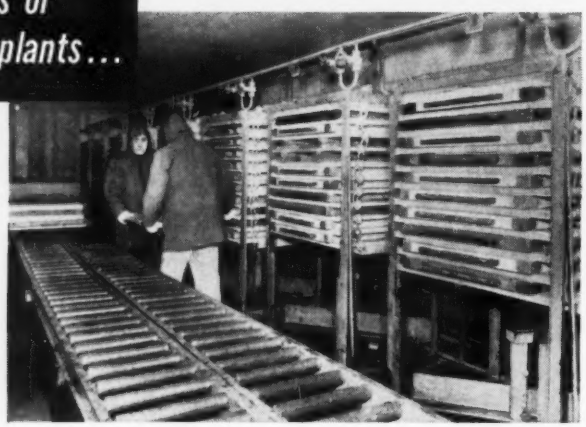
Wherever you refrigerate food...



in package freezers, display cases or frozen food plants...



Insist on

genetron®

SUPER-DRY REFRIGERANTS

"Genetron" super-dry refrigerants are universally accepted for use as original or replacement charge in modern equipment designed for fluorinated hydrocarbon refrigerants. Leading manufacturers of frozen food refrigeration equipment approve them. Refrigeration engineers specify them. Wholesalers recommend them. Servicemen and contractors know they can depend on them. That's because "Genetrons" offer unexcelled purity and dryness . . . and their strict quality specifications are consistently *bettered* in production. "Genetrons" are available from wholesalers everywhere, coast to coast.

See your wholesaler! Insist on "Genetron"!

A "Genetron" Super-Dry Refrigerant for every frozen food application!

genetron 11 ORANGE LABEL CCl_3F TRICHLOROMONOFLUOROMETHANE
genetron 12 WHITE LABEL CCl_2F_2 DICHLORODIFLUOROMETHANE
genetron 22 GREEN LABEL $CHClF_2$ MONOCHLORODIFLUOROMETHANE
genetron 113 PURPLE LABEL $C_2Cl_3F_3$ TRICHLOROTRIFLUOROETHANE
genetron 114a BLUE LABEL $C_2Cl_2F_4$ DICHLOROTETRAFLUOROETHANE

Allied Chemical

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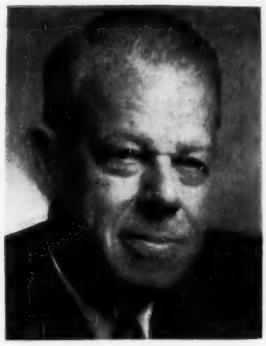
MEN & COMPANIES



William A. Burkhart

Milton C. Mumford

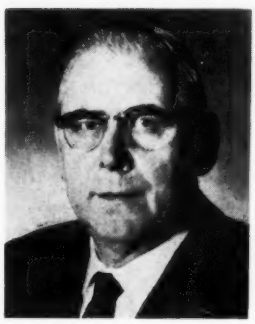
North American Pitch . . . Growth abroad is not a one-way street. Behind recent management shuffle at Lever Bros. Co. is seen significant boost in Unilever's U.S. and Canadian business.

Board Chairman William H. Burkhart has added chairmanships of Thomas J. Lipton, Inc., and Lever Bros. Ltd. And as top man of three firms that represent Unilever in this hemisphere, he takes over job of liaison with parent organization. Heretofore, a British contact director performed this task.

He gives up post as Lever president-chief exec. officer to Milton C. Mumford, previously exec. v.-p. Mr. Mumford is a Nutrition Foundation trustee.

Further promotions include: Marketing V.-P. Warren N. Burding to exec. v.-p.; Advertising V.-P. Henry Schachte to exec. v.-p.; Robert McDonald, gen. mgr. of Foods Div., to v.-p.

All have important food backgrounds. Mr. Burding has been president of Lever's Good Luck Div. (now Foods), and before joining Lever was a Standard Brands v.-p. Mr. McDonald also was formerly associated with Standard Brands, Inc. Mr. Schachte has been advertising director for Borden Co.



Dr. Albert L. Elder

Starch & Protein Expert . . . Heading American Chemical Society in 1960 will be prominent food chemist, Dr. Albert L. Elder. Recently chosen president-elect, he has been research director of Corn Products Co., Argo, Ill., since 1944.

Under his lead, firm's labs have achieved such outstanding research as delving into role of corn oil in decreasing formation of cholesterol, tentatively blamed for certain heart disorders.

Among numerous honors, Dr. Elder has been chairman of AIC's advisory committee to U. S. Sec'y. of Agriculture. For service from '44 to '57, he received Quartermaster Food & Container Institute's award of appreciation.

He was president of QF&CI's R&D Associates from '51 to '53 and chairman of the National Research Council and Quartermaster Advisory Board's committee on foods from '54 to '57.

He has served on Institute of Food Technologists' committees on liaison with the armed forces and on chemicals in foods.

W. Elliot Brownlee has been elected manufacturing v.-p. of Sunshine Biscuits, Inc.

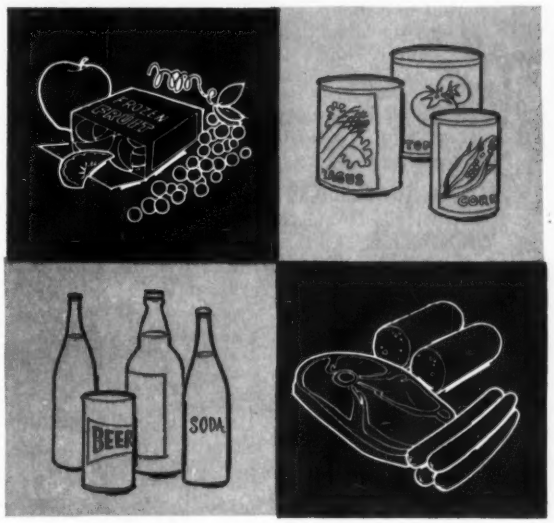
Dr. Oral Lee Kline is new head nutrition division of FDA. He succeeds Dr. E. M.

PRESERVE COLOR PRESERVE FLAVOR ECONOMICALLY

WITH

TAKAMINE

SODIUM ISOASCORBATE AND ISOASCORBIC ACID



These TAKAMINE antioxidants have proved completely reliable in the processing of frozen fruits, canned vegetables, beer, carbonated beverages, meats and fish. They protect the natural color and flavor and assure longer shelf-life. It's the easy, efficient way to control food quality, increase customer satisfaction, and assure greater profits for you!

It will TASTE better
LOOK better
SELL better
with TAKAMINE products

Write our Technical Service Department for complete information pertaining to your particular product problem!

TAKAMINE LABORATORY

DIVISION OF MILES LABORATORIES, INC.
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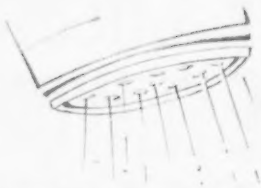

WS SIFTER TOPS make Dollars and Sense

In the shifting sands of spice sales, WS SIFTER TOPS are taking a strong stand.

Women like them.
Men like them.
Everyone likes the convenience they add to your package.
YOU'LL like what they do to your sales.

WS SIFTERS are easy to apply—just snap on. They do double duty—no cap liner is necessary.

IF YOUR PRODUCT IS SIFTABLE GET FULL INFORMATION ON WS SIFTER TOPS
Ask your WS salesman, write, or call collect—Warwood 1540

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Nelson, deceased Dec. 24. He will direct research programs. Previously he headed food division. **Dr. Henry Fischbach** succeeds him in that capacity.

Industry

American Tuna Canning, Inc., new organization headed by K. J. Berglund, San Diego, has taken over Terminal Island plant of South Coast Fisheries, Inc.

Consolidated Foods, Inc., has purchased **Hershey Wholesale Grocery Co.** and its subsidiary, **Central States Wholesale Co.,** for reported $1 million-plus.

Cudahy Packing Co.'s new Omaha plant (cost estimated at $4.5 million) is scheduled for completion in early or mid-1961.

Di Giorgio Fruit Corp. has acquired control of **S&W Fine Foods** with purchase of over 75% of outstanding common stock at estimated price of $6.3 million. Largest block of committed stock was held by United Vintners, Inc.

R. T. French Co. is opening sections of its new "pushbutton" warehouse in Rochester, N. Y., and expects to have entire facility in use by mid-spring.

Industrial Molasses Corp., Leonia, N. J., has let contracts for construction of its new bulk liquid terminal in Toledo, Ohio.

Qualitee Dairy Products Assn., San Diego, and **Carnation Co.,** Los Angeles, have announced their merger.

Standard Brands, Inc., says that '58 sales were up to $519.7 million from $513.9 million in 1957. Net income increased from $13.8 million to $14.7 million.

Associated Industries

Aluminum Assn.'s new president is M. M. Anderson, v.-p. of **Aluminum Co. of America,** Pittsburgh.

Ball Bros. Co., Inc., will build new multi-million dollar glass container plant on 27-acre site at Asheville, N. C. Completion is anticipated in late '59.

Blaw-Knox Co.'s Chemical Plants Div., Pittsburgh, has received contract to design and construct addition to soybean processing plant of Quincy Soybean Products Co., Quincy, Ill.

Brockway Glass Co. is building new lab & research center as first step in 5-yr. program to culminate in general services plant at Brockway, Pa., centralizing firm's nationwide technical and production control.

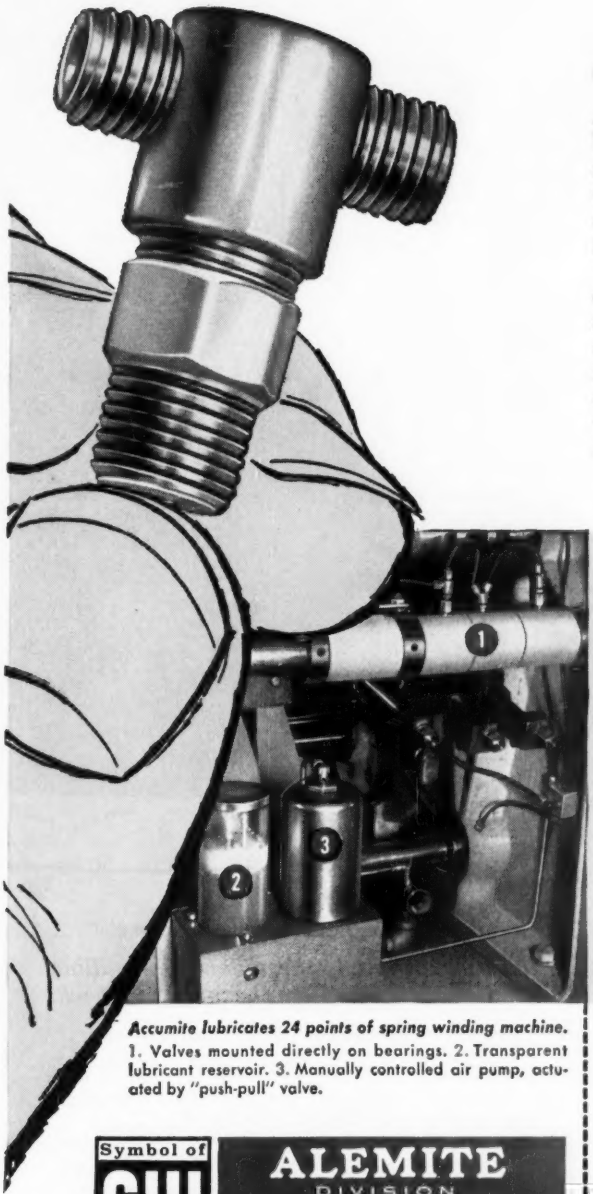
Nuclear Science & Engineering Corp., Pittsburgh, has received AEC contract for development of radioisotope devices and techniques. One phase of project covers improved nuclear gage of special interest in food processing, for measuring levels of extracts or concentrates stored in sealed tanks under highly sterile conditions.

Pollack Paper Corp.'s V.-P. James V. Melton has been elected president and board chairman of Waxed Paper Merchandising Council. He replaces retiring Joseph C. Tobin of **Crown Zellerbach Corp.**

A. E. STALEY MFG. CO., Decatur, Ill., has scheduled immediate construction of new $1 million-plus center to house firm's expanding research program. Main part will be 4-floor laboratory with modular arrangement of 138 units that may be used singly or in groups of 2 to 12. Among unusual facilities designed for specific research programs are "special climate" rooms, and room for taste-panel testing.

ACCUMITE® BY ALEMITE

...TO GIVE ANY MACHINE ALL THE ADVANTAGES OF CENTRALIZED LUBRICATION...AT LOW COST!



Accumite lubricates 24 points of spring winding machine. 1. Valves mounted directly on bearings. 2. Transparent lubricant reservoir. 3. Manually controlled air pump, actuated by "push-pull" valve.

Engineered for limited space, outperforms many higher-priced systems!

Alemite—with more than 40 years of centralized lubrication experience—announces an all-new compact system complete with pump, metering valves and controls—especially designed to service many machines and vehicles where centralized lubrication has been impractical until now!

Alemite's new compact Accumite system is especially adaptable to light, precision, multiple-bearing machines that have limited installation space. Its small size and simple installation overcomes cost limitations in most plants. Typical applications are: packaging, canning, labeling and textile machines...and machine tools. It is also suitable for tractor trailers, lift trucks and farm implements.

ACCURATELY METERS THESE SHOTS OF OIL OR GREASE

.003 cu. in. .006 cu. in. .009 cu. in.

ALL THE ADVANTAGES OF "BUILT-IN" MEASURED LUBRICATION—PLUS COMPACT SIZE!

- Meters exact amounts of refinery-clean lubricants to all bearings whenever system is operated.
- Eliminates shutdown time for lubrication.
- Seals lubricant against dirt, grit and water.
- Prevents bearing troubles due to neglect or use of wrong lubricants.
- Services all bearings in one operation.
- Avoids work spoilage and bearing repairs due to overlubrication.

Mail coupon for full information!

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Please send me all the facts about your new "Miniature" Accumite system.

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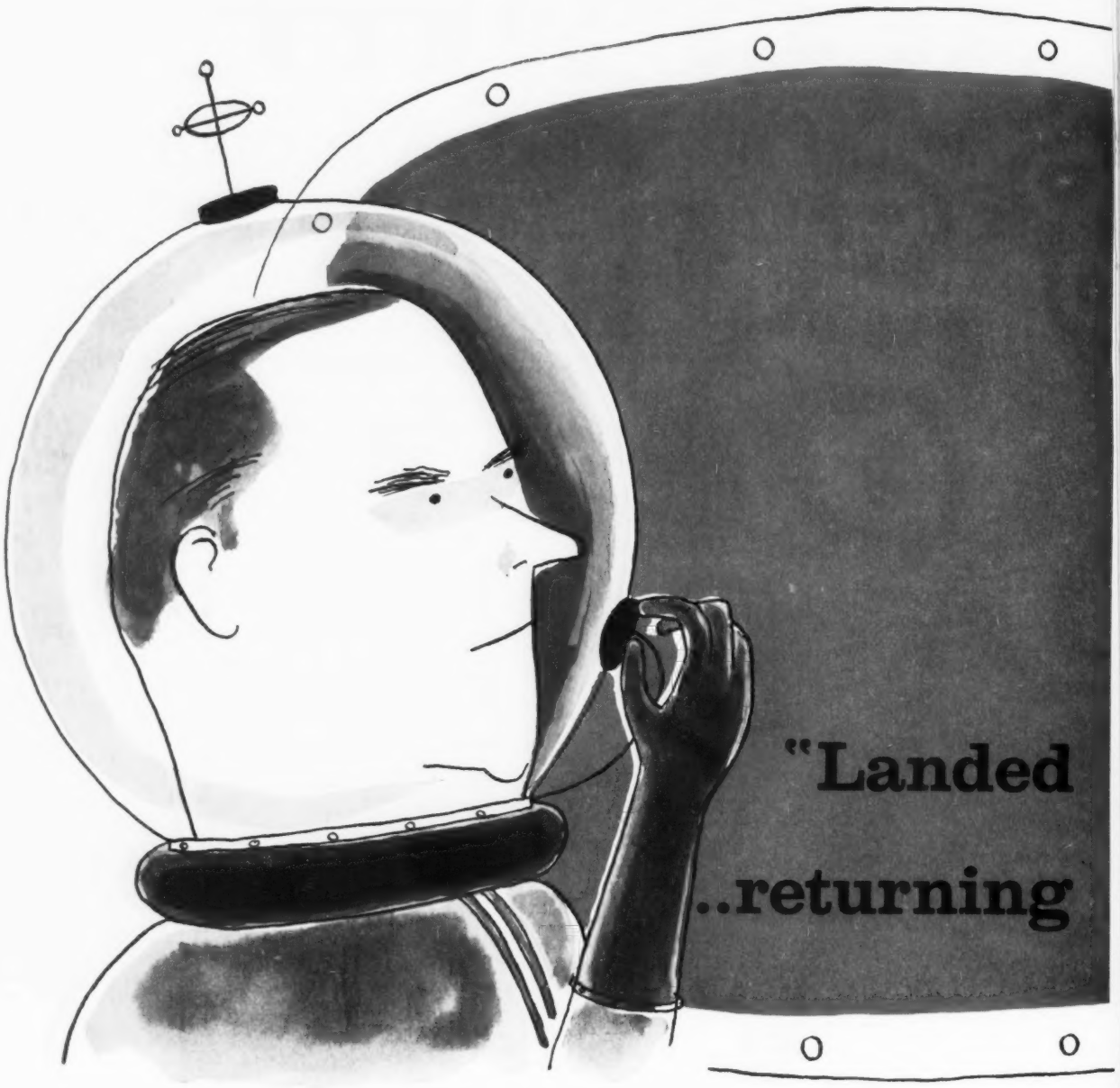


The can-opener is mightier than the missile . . .

Each year housewives rip, zip through half-a-million miles of tinplate—to the moon and back.

Food is an amazing business . . .

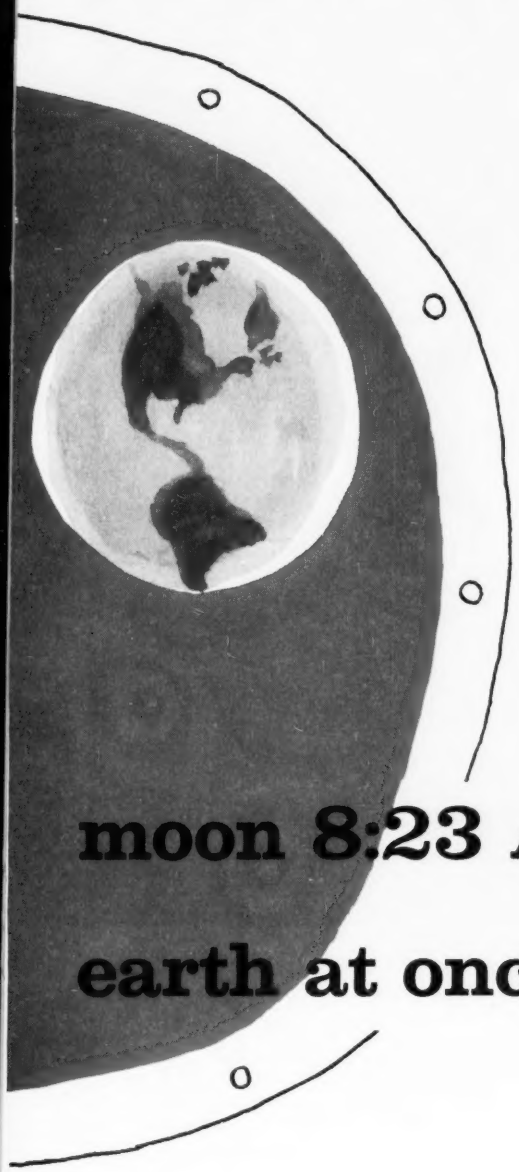
Contrary inventor dreams up machine to make rice from corn. Kellogg . . . cocoa Rice Krispies.

Revolution in bread . . . new continuous dough process . . . two men now bake 6,000 loaves an hour.

Food is a crazy business . . .

General Foods opens new Kitchen Dept. . . . invites women to "try, taste and tell us what to make."

Meanwhile, back in the big green building on W. 42d St., a McGraw-Hill magazine makes sparks . . .



moon 8:23 A.M...cold, hungry earth at once...FOODNIK"

Food is a crazy, amazing $70 billion business, growing bigger with every baby.

And right in the middle of it, eyeing everything like a house detective . . . reporting back sharp and sure . . . the new FOOD Engineering, *McGraw-Hill's magazine for management in manufacturing, packaging, marketing.*

Here, "Total Marketing Concept" vigorously at work in print. A natural! The hot, competitive food climate incubates broad-gauge management. Key men – production to sales – live in a community of constant pressure for finer products, fatter margins, faster turnover.

A food company president says it better, *"Every one of my management associates must see our problems as I see them."*

Now well into their second year with *"the complete magazine for the whole man,"* FOOD Engineering's editors are steamed up by the challenge; heartened by happy reader response; ready for bear. Willingly we leave to other media any areas of restricted, "splintered" interest. For us, for our aggressive management audience – no blinders, thank you.

How goes the battle? Great! Every bit as bright as our conclusive research, back in early '57, promised. We asked 4,375 food management men in all functions what they wanted most to read. They told us–pointedly. Their "cross-communication" receptivity was intense. Technical men, for instance, were as interested in *packaging* as *technology.* Sales managers were only slightly less interested in *production* than *marketing.* Even "dyed-in-the-wool" production bosses were hungry for *packaging* and *marketing* material. Since then, issue by issue, our "Reader Feedback" reports prove this out.

Nothing has been taken away of the "meat and potatoes" that made FOOD Engineering the "most useful" magazine in its industry. "Marketing" has been the big *value added.* That's why today *"the complete magazine for the whole man"* makes the new FOOD Engineering so much more exciting an advertising performer for you.

For Management in Manufacturing, Packaging, Marketing

FOOD
ENGINEERING

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. . . you are looking at the only lug cap

that gives you a **LIVE RUBBER SEAL**

Crown pioneered the development of the quarter-turn lug cap. And only CROWN offers you the positive protection of a *live rubber* seal. Live rubber will *reseal* again and again. There is *no deterioration* or "setting"—elasticity assures *conformance* even to rough jar lips. Live rubber is the *best* material for withstanding live steam and pasteurization temperatures.

CROWN lug caps are designed for maximum mechanical efficiency as well as the fashion flair.

Deeper sides give added strength and ease of handling. Choice of plain or knurled sides offers you maximum flexibility for all product lines. Crown's exclusive, *flat-seating lug* threads give positive, non-loosening seal—with or without vacuum pack.

For lug caps to fit all your requirements—no matter how exacting . . . for C.T. caps with the broadest selection of liners ever offered . . . let Crown serve you.

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9300 Ashton Road, Philadelphia 36, Pa.

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NEW EQUIPMENT & SUPPLIES

←Go quickly into place . . .

. . . to form room-brightening wall

New Prefab Panels Make Functional Translucent Walls

A radically new construction panel, ing, tradenamed Kalwall, comprises an aluminum grid bonded between two sheets of translucent glass-fiber plastic (polyester).

This development is an outgrowth of the striking translucent roof employed on the U. S. Pavilion at the Brussels Fair.

Many advantages are afforded: The paneling's translucency is a particular feature for modern, functional design of both walls and roofs, giving soft, glareless interior lighting.

Maker states that walls admit up to 85% of light reaching them, yet permit little sun heat to enter building, or interior heat to escape. This attests to the 2¾-in. paneling's high insulating factor, reportedly equivalent to 8 in. of brick.

Sandwich structure makes for exceptional strength, yet 20x4-ft. panels are light enough for ready handling into place by two men (photo). And a 100-yd. section of wall can be put up by four men in only four days. Curtain walling is thus formed without need for supporting frames (panels anchor into tracks).

Panel units are completely prefabricated and sealed at the factory, with inclusion of any combination of windows, doors, or vents. Not only overall soft colors but also unique combinations of color inserts and opaque panels may be employed.

Because of light weight of units, a lighter foundation is permitted, thus saving costs. And buildings are readily expandable, since panels are easily taken down and reerected.—*Kalwall Corp., Manchester, N. H.*

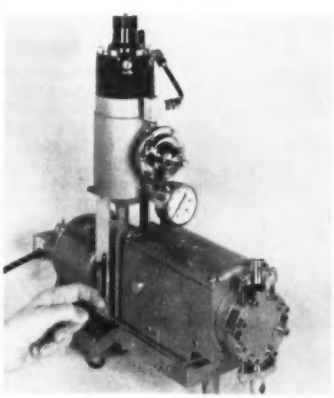
Circle 16 on Reader Service Card

Air-Signal Metering Pump

Pneumatic instruments adjust rate from zero to full capacity in operation of this new automatic metering pump. Called the Auto-Pneumatic Micro-flo Pulsafeeder, unit is designed to supply precise measured flow without use of constant level controls, high head tanks, or stuffing box pumps.

As will be noted (photo), an air cylinder is mounted over the stroke-adjustment mechanism. Position of piston within this cylinder is determined by variations in pressure (controlled by sensing instrument).

Change in piston position is mechanically transmitted through a cam to the stroke-adjusting mechanism

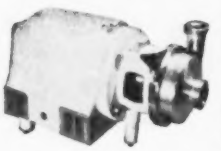


that controls pump output.—*Lapp Insulator Co., Inc., LeRoy, N. Y.*

Circle 17 on Reader Service Card

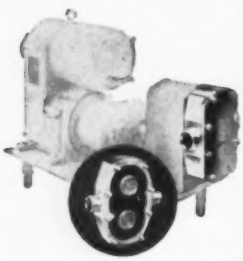
Put Them to Work This Season...

CP Cost Cutters



Sanitary Centrifugal Stainless Steel Pumps

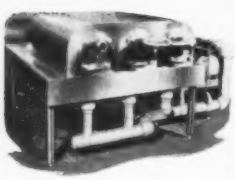
Ruggedly built to reduce maintenance costs with special emphasis on economical fast cleaning. Can be dismantled without tools. Complete range of sizes and capacities to match the pump to the job—buying exactly what you need saves you money and operating cost. Pump both product and cleaning solution. Write for Bulletin H-1200.



ROTARY Pumps

Sanitary, Positive Type

New rotors with specially designed resilient surfaces. Parts can be replaced *on the job* in ten minutes or less when necessary. The perfect pump for metering flow of medium to high viscosity liquids. Write for Bulletin H-1290.



Swept Surface Heat Exchanger

Cuts costs of continuous heating and cooling of liquids and semi-solids; also ultra-H.T.S.T. pasteurizing. Cools to —30° F. or heats to 300° F. or higher. Heat exchange is uniform and efficient for entire run because Displacer-Mixer Blades continuously sweep product away from heat transfer surface. Ideal for heavy-bodied syrups and concentrates. Write for Bulletin E-1300.

Also Plate Heat Exchangers—Bulletin E-1153.

Refrigeration

Double savings: compact design saves valuable space—extra rugged construction saves maintenance. Choose exactly what you need from a complete line of Compressors and Boosters—and get the *extra* benefits that come from CP's generations of experience in building refrigeration systems serving many industries—and serving them well. Write for Bulletin V-18.

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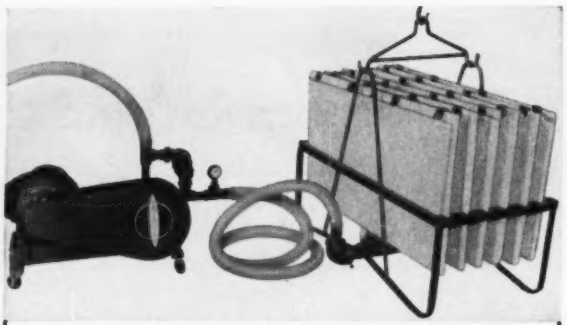
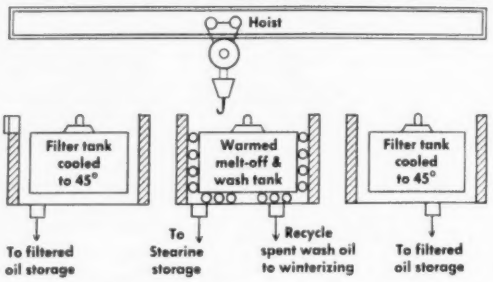
THE MARK OF DISTINCTION IN FOOD PROCESSING EQUIPMENT

98 For more data, circle 301 on Reader Service Card



This is the Sparkler Model RW filtering unit that gives greater flow and better yield than conventional methods in—

REMOVING STEARINES from WINTERIZED OILS


Hoist
Filter tank cooled to 45°
Warmed melt-off & wash tank
Filter tank cooled to 45°
To filtered oil storage
To Stearine storage
Recycle spent wash oil to winterizing
To filtered oil storage

THIS NEW filtration process consists of the vacuum type filter plates (illustrated above) operating in an open tank cooled to 45° F. No pressure is used and the problem encountered in pressure filtration of the extremely low compressive strength of the Stearine cake is thus eliminated. Also no cold room is required. At the end of the filtering cycle the plate assembly coated with the Stearine cake is lifted out and immersed in a melt-off and wash tank to recover the Stearine which is piped to a storage tank.

By using two filter tanks and one melt-off tank a practical continuous operation is achieved.

The filter plates are the Sparkler plug-in type with a bottom outlet that is self sealing in a discharge manifold. No bolts or screw fastenings are required. Plate covering is a synthetic fibre cloth, bag shaped, to slip on over the plate and is sealed with clips.

Sparkler filtration engineering service is available for special applications of this filter.

For the oil industry, Sparkler filtration engineers have developed individual specialized filters for —

- **Removal of "foots" from crude oil**
- **Removal of bleaching clays**
- **Recovery of hydrogeneration catalyst**
- **De-stearinization of winterized oil**
- **Final polishing of finished oils**

SPARKLER FILTERS

SPARKLER MANUFACTURING CO.
MUNDELEIN, ILLINOIS, U.S.A.
Sparkler International Ltd., Manufacturing Plants at Leliegracht 9, Amsterdam, Holland; Toronto, Ontario, Canada; Italy and Australia.

Filtration Engineering & Manufacturing Exclusively for Over 30 Years

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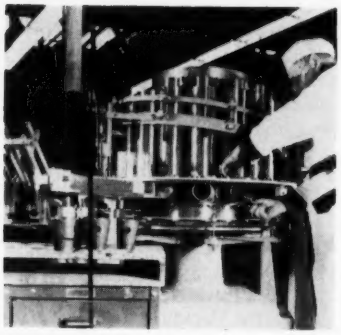


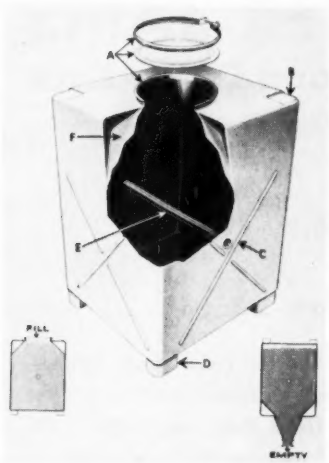
Jiffy-Adjustment Piston Filler

Through advanced design, new 14-station RP-214 rotary piston filler cuts height-change downtime as much as 80%. Key to saving is fact that bowl and cam ring remain undisturbed during change.

Fill adjustment can be made over full range of cylinder capacities without replacing cam track, and with accuracy-of-fill control conveniently located, there is safe, easy adjustment while unit is operating.

Machine handles semi-viscous to semi-solid products that may range from consistency of evaporated milk to potted meat. Cylinders come in three sizes for filling cans of 1¾, 2¾, and 3¾-in. dia.—*The Pfaudler Co., 1083 West Ave., Rochester, N. Y.*

Circle 18 on Reader Service Card



Cost-Saving Bulk Handler

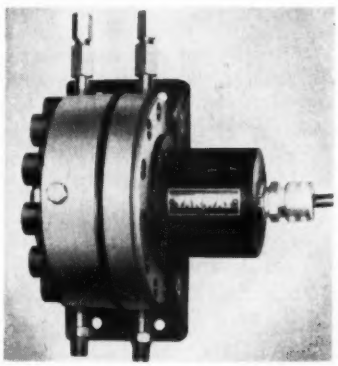
Foods of dry granular or powdered type, as flour or sugar, are speedily and economically handled, stored, and shipped using the Invert-A-Bin, pictured above in cutaway.

For filling and emptying (see small sketches), unit conveniently employs a single orifice.

This orifice is standard drum-type closure—(A) in illustration—presenting wide 22-in. opening for easy loading, unloading, and inspection. Of rugged construction (steel or aluminum), unit includes easy-spotting nesting pockets (B), stiffening corrugations (C), and heavy-gage legs (D).

Trunnion tube (E) provides simple means of inverting and overhead handling. At (F) is seen internal transition cone, which is welded to four side walls. Conforming to angle of repose of commodity when container is full, this cone assures complete unloading of contents when bin is inverted.—*The Powell Pressed Steel Co., Hubbard, Ohio.*

Circle 19 on Reader Service Card



Monitors Remote Controllers

Precise, dependable action is accented in new differential pressure transmitter designed for monitoring distant controllers, indicators, or other type of electric receiving instruments.

Unit employs diaphragm in pressure housing (pressure connections at bottom) and a sensing coil that operates remote receiver via cable connection (right in photo). Instrument links to fluid line, liquid vessel, or other container, by two tubes.—*Yarnall-Waring Co., 127 Mermaid Ave., Philadelphia.*

Circle 20 on Reader Service Card

Want More Information?

It's free—and easy to get. Simply note here the items on which you want more details, then circle each key number (there's one at the bottom of each item) on the handy Reader Service Postcard—back of book. Then sign your name and address and mail. For your convenience, too, these items are listed and keyed in the Reader Service Section.

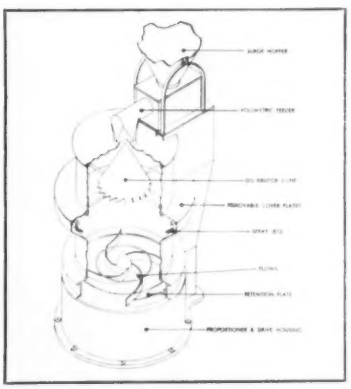
Quick-Change Case Printer

Entire lines of case-print copy can be replaced in seconds with new "zip-change" printing drum used on redesigned line of Rolacoders.

Thus, operations are simplified where there is frequent need for change of brand name, color, flavor.

Dies may be supplied in logotypes of complete wordings, as specified by user.—*Adolph Gottscho, Inc., Hillside, N. J.*

Circle 21 on Reader Service Card

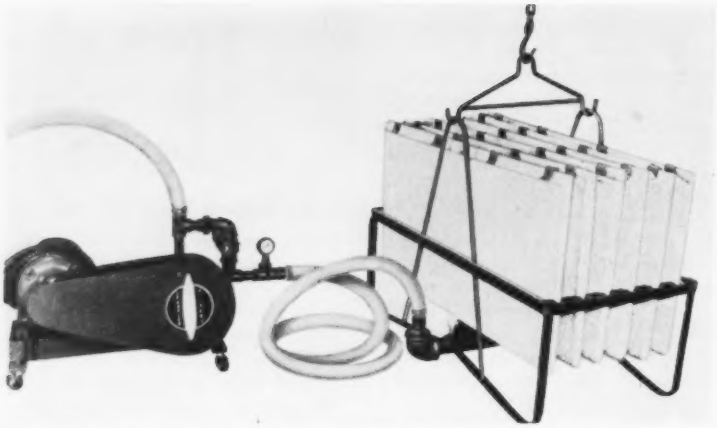


'Flow' Blender for Mixes

Here's a new continuous-flow blender designed to accurately proportion, blend, and discharge a variety of dry or liquid-dry mixtures.

As shown in diagram, products are fed into unit (Verticone) via volumetric feeding equipment onto apex of a cone, which produces a circular, falling curtain of material. At base of cone, jets can disperse liquids into the mixture. Liquid is sprayed on blended material from both inside and outside the curtain as it falls onto a retention plate. Here there is further mixing.

Controlled wetting may impart from a fraction of an ounce of liquid to any desired amount. Housing, feeder, and drive may be selected to meet sanitary conditions. All wear areas, such as distribution cone and retention plate, may be reinforced with removable wear plates. Mixing blades are easily replaceable.—*Johnson-March Corp., 1724 Chestnut St., Phila.* Circle 22 on Reader Service Card



Simplifies Extraction of Stearines From Winterized Oil

Removal of stearines from winterized oils is expedited with use of a new filter (Model RW) employing vacuum-type filter plates in an open tank cooled to 45F.

System is stated to give 2½ times greater flow per sq. ft. of filtering surface than coventional methods.

Since no pressure is used, problem of extremely low compressive strength of the stearine cake is eliminated. Also, no coldroom is needed. At end of filtering cycle, plate assembly with cake is lifted out and immersed in a meltoff-and-wash tank to recover the stearine. —*Sparkler Mfg. Co., Mundelein, Ill.*

Circle 23 on Reader Service Card

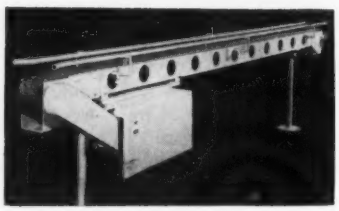
Fills Liquids 'Bottom Up'

With use of a new fast-action filling valve (patent pending), liquid foods are dispensed into containers "bottom-up" fashion. This prevents air entrainment in odd-shaped bottles as well as the tendency for some products to foam.

On completion of fill, the dispensing stem retracts within a tube subject to vacuum—preventing dripping from stem as it leaves container.

In operation, filling stem is cammed down, just prior to liquid release, until it nearly contacts inside base of container. Then product flows from orifices just above tip of stem. And in remainder of cycle, orifices are always submerged.—*The Karl Kiefer Machine Co., Cincinnati, Ohio.*

Circle 24 on Reader Service Card



Speeds Travel of Cans, Jars

Cans, jars, and bottles move with new efficiency on the improved line of Silent-Top conveyors. Widths run 3¼ to 7½ in.

Quiet, high-speed operation (to

SPEAS
APPLE PECTINS
Standard of Quality for 30 years

BETTER JAMS
Jellies and Confections Because...

1 Wide pH Range
2 Uniform Strength
3 Neutral in color and flavor—blends naturally with more different fruits than any other pectin
4 Makes jams & jellies with an even, smooth texture (never grainy) and improved spreadability

• NUTRL-JEL Regular and Slow Set. } For Preserves, Jams, Jellies and Marmalades
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Plants in Apple Regions From Coast to Coast Assure Dependable Supply
SPEAS COMPANY, GENERAL OFFICES, KANSAS CITY 20, MISSOURI

A **Y Globe** that challenges comparison shows it pays to

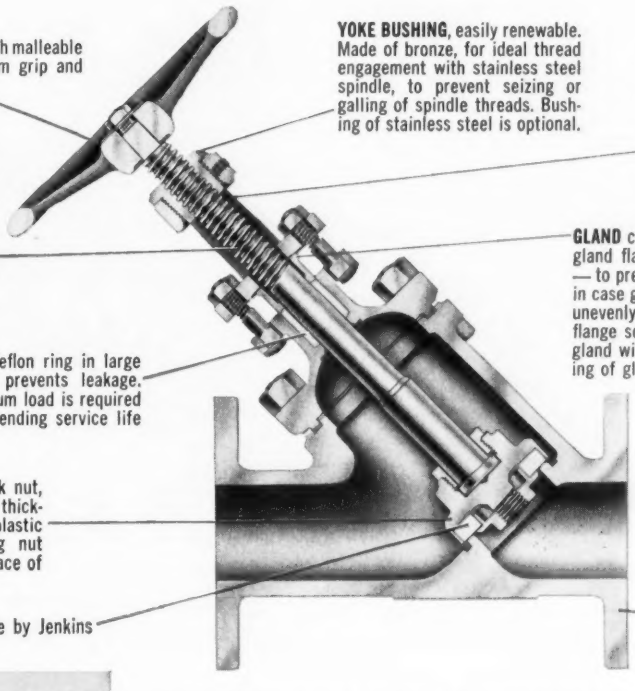
Specify JENKINS for STAINLESS STEEL Valves, too

Want the "best buy" in Stainless Steel Y Globe Valves? Compare this Jenkins Fig. 1335 with any on the market. You'll conclude that it's hard to beat Jenkins at making valves, no matter what the material.

You'll find genuine superiority of design and construction in the features shown here. But no picture can show the quality of the castings . . . the precision machining . . . the rigid inspection and testing that have gone into this valve. All of these are as important as design and metal alloys in assuring long, dependable, economical valve service. And, all of them are up to the peak standards for which Jenkins has been known for almost a century.

SEND FOR NEW CATALOG of Jenkins Stainless Steel Valves, in patterns and alloys that satisfy the requirements of practically all corrosive services.

These Jenkins Valves meet valve industry specifications and the high standards established by leading users of stainless steel valves.



WHEEL of high strength malleable iron designed for firm grip and easy operation.

SPINDLE of large diameter and dense structure has high resistance to wear and torsion strains. Easy, tight closing is assured by long, precision machined thread bearing surfaces. A beveled shoulder provides backseating against inside of bonnet, permitting repacking under pressure.

PACKING A Teflon ring in large packing box prevents leakage. Only a minimum load is required on gland, extending service life of packing.

DISC HOLDER, held by lock nut, has depth equal to disc thickness, preventing flow of plastic disc. Wide disc retaining nut covers all but seating surface of Teflon disc.

DISC is Teflon made by Jenkins

YOKE BUSHING, easily renewable. Made of bronze, for ideal thread engagement with stainless steel spindle, to prevent seizing or galling of spindle threads. Bushing of stainless steel is optional.

YOKE BONNET, a single unit, has liberal space between yoke arms for easy access to packing box. Tongue and groove joint with body makes a pressure-tight seal with less tightening on the bolts, and eliminates possibility of blowing out the Teflon gasket.

GLAND consists of two pieces — gland flange and gland follower — to prevent binding of follower in case gland bolts are tightened unevenly. Crowned surface of flange secures tightness against gland without excessive tightening of gland nuts.

BODY Through-port design for full, free flow. Liberal seat height permits repeated refacing. Cast on body are directional arrow and bosses for drain connections. End flanges conform to M.S.S. specifications.

JENKINS
LOOK FOR THE JENKINS DIAMOND
VALVES

Sold Through Leading Distributors Everywhere

JENKINS BROS., 100 Park Avenue, New York 17, N. Y.

☐ Send the new stainless steel valve catalog

☐ Have a representative call on me

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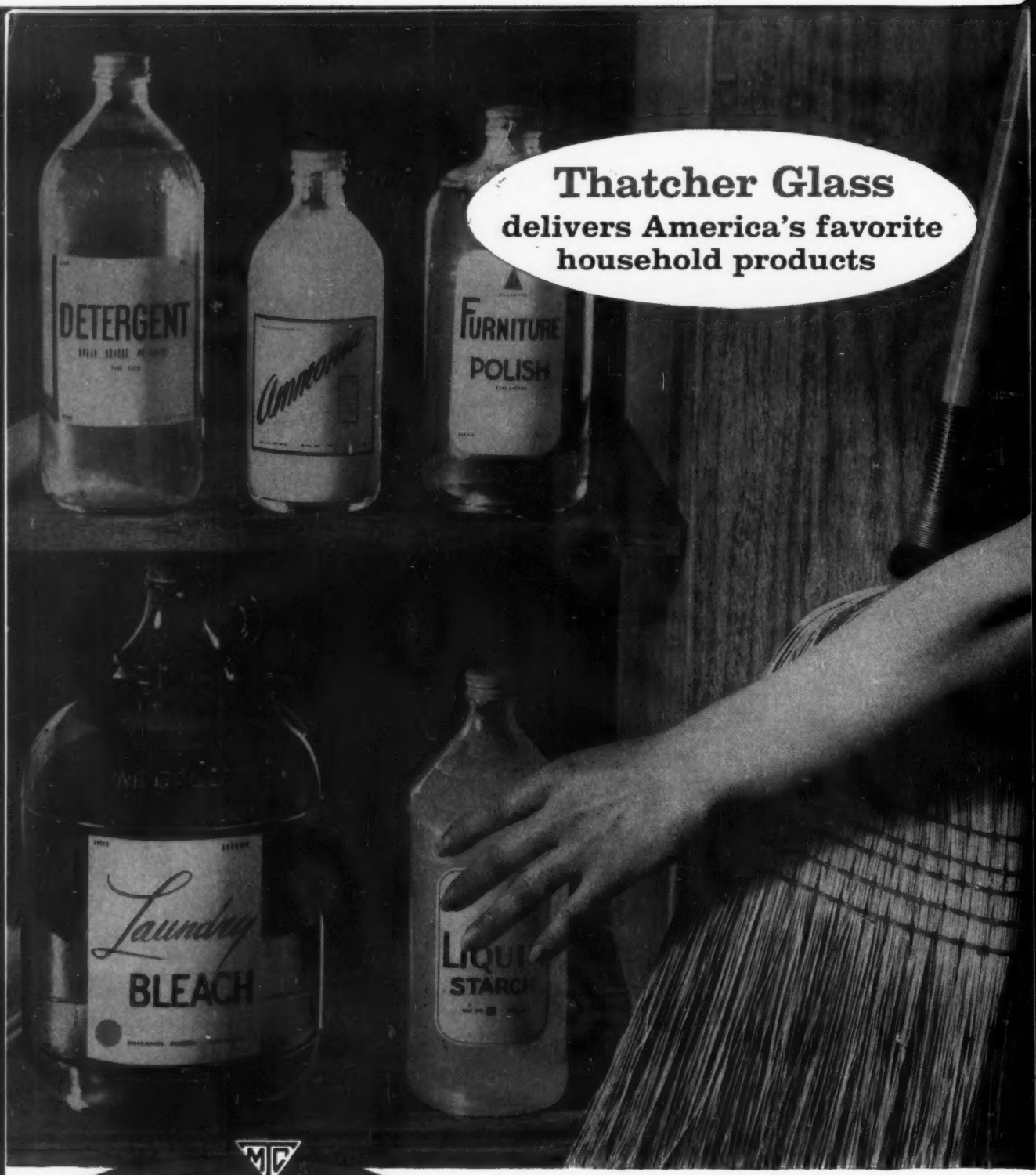


Thatcher Glass
delivers America's favorite household products

Thatcher Glass

Package your household products in glass and you've taken the most important step toward creating satisfied customers. Because glass is chemically inert, your product retains its full strength and quality from the time the bottle is filled until the last drop has been used. Thus Thatcher provides the kind of shopper assurance that means repeat sales—greater profits. Your Thatcher representative has some enlightening facts on the advantages of packaging in glass. He is ready to discuss stock or private mold containers, and can offer merchandising ideas, suggestions and recommendations on packages that sell.

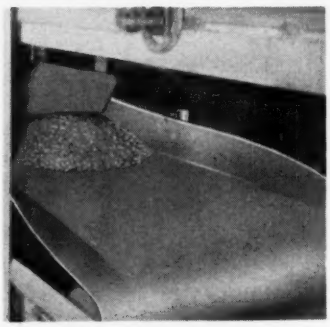
THATCHER GLASS MANUFACTURING COMPANY, INC., NEW YORK, N. Y.

FACTORIES: Elmira, N. Y., Jeannette, Pa., Streator, Ill., Lawrenceburg, Ind., Saugus, Calif.
SALES OFFICES: Elmira, N. Y., Boston, Hartford, New York, Philadelphia, Detroit, Chicago, Minneapolis, Louisville, Los Angeles, San Francisco, St. Louis

200 fpm.) is attained with use of a continuous nylon track under both load and return sides of belt. No lubrication is needed. Lower return strand of belt is supported for clean and safe operation with no catenary.

Also available are adjustable or fixed side rails, transfers disks, rotary tables, accumulating conveyors, and other accessories.—*M-H. Standard Corp., 515 Communipaw Ave., Jersey City, N. J.*

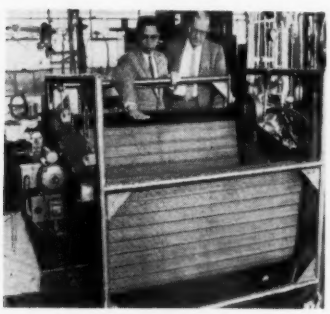
Circle 25 on Reader Service Card



'Flanging' Sanitary Belting

Exceptionally high sanitation is cited for Dura-Flex-Wall conveyor belting (taste-proof, non-toxic neoprene compound).

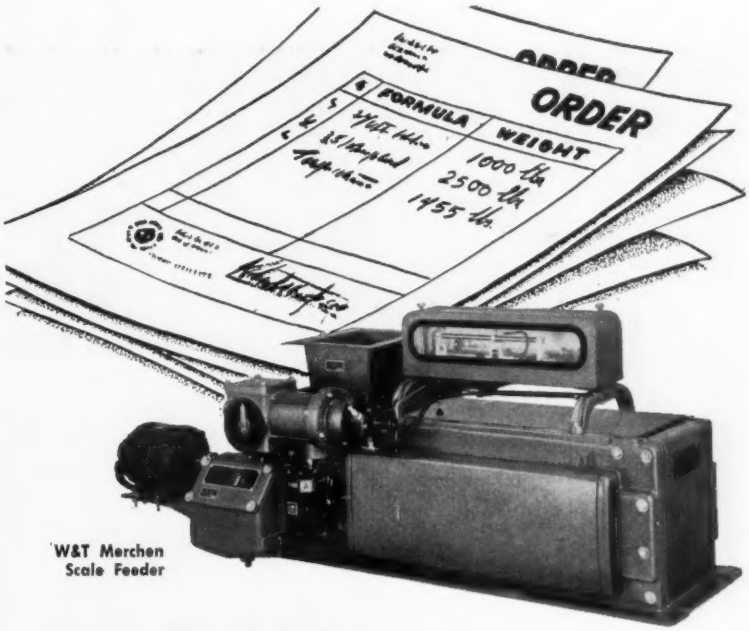
The long-life material may be side-flanged (photo) to height as desired, thus abolishing insanitary product contact with stationary side-boards or troughing. Belt will go around pulleys as small as 3 in., regardless of height of flanges.—*Dura Belting Co., Inc., 715 Heinz Ave., Berkeley, Calif.* Circle 26 on Reader Service Card



Trough-Belt Speeds Drying

Built on USDA concept, improved dehydrator for fruits and vegetables employs a continuously moving steel-conveyor trough for holding the food while heated air is forced upward through belt's wire mesh.

Belt is of special woven wire, permitting free circulation of air, yet



W&T Merchen Scale Feeder

IF YOUR PROFITS DEPEND ON WEIGHT...

The Best Weigh Is... The Merchen Way

The connection between profits and weight in industrial operations makes weighing the heart of any process. Reducing waste of materials by accurately weighing and controlling the amount put into your product puts profits in your pocket.

W&T Merchen Scale Feeders accurately and continuously weigh and control the flow of free flowing solid materials to within ± 1% of set feed rate over a 100:1 range. Feed rates from as little as 3 to as much as 3,000 lbs. per minute can be controlled precisely.

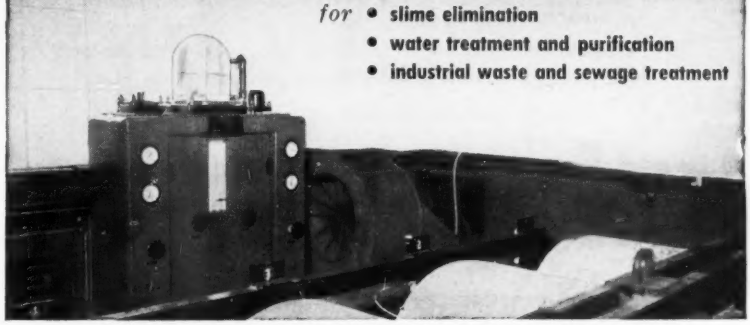
Any dry batch blending operation can be made automatic or even continuous by installing W&T Merchen Scale Feeders to provide accurate control of your process . . . by weight.

For complete information, write to Dept. M-41.37

WALLACE & TIERNAN INCORPORATED
25 MAIN STREET, BELLEVILLE 9, NEW JERSEY

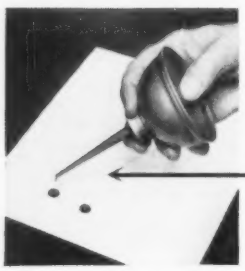
CHLORINATORS and CHEMICAL FEEDERS

for
- slime elimination
- water treatment and purification
- industrial waste and sewage treatment



WALLACE & TIERNAN INCORPORATED
CD-41.37 25 MAIN STREET, BELLEVILLE 9, NEW JERSEY

HAVING PACKAGE TROUBLE BECAUSE OF FATS GREASE OILS ?



GREASE-PROOF PATAPAR STOPS PENETRATION

NO GREASE "CRAWL"

THE TEST: Drops of oil placed on this Patapar remain on the surface indefinitely. The oil will not spread or "crawl." No seep through.

As a packaging material, or wherever a grease-proof barrier is required, new types of Patapar Vegetable Parchment provide positive resistance. With these grease-proof Patapars there is no penetration. Oil will not spread on Patapar's surface. There is no grease crawl—no "wetting".

Patapar is used alone for packaging, or laminated to other materials for end uses such as fiber drums, spiral tubes, cartons.

Patapar gives you WET-STRENGTH, too

High wet-strength is a basic quality of the many different types of Patapar. And, made from pure cellulose, Patapar is odorless, non-toxic. *It is furnished plain or colorfully printed.*

If you would like to test Patapar, write us telling your requirements. We'll send technical information and samples of the type we recommend for your purpose.

Patapar® VEGETABLE PARCHMENT

HI-WET-STRENGTH · GREASE-RESISTING

PATERSON PARCHMENT PAPER COMPANY, *Bristol, Pennsylvania*

West Coast Plant: Sunnyvale, California · Sales Offices: New York, Chicago

SPECIAL PAPERS FOR SPECIAL PURPOSES

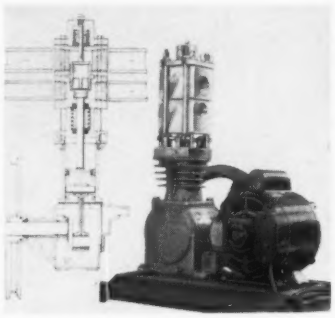
Equipment and Supplies

virtually eliminating losses through the mesh.

It's stated that efficient dehydration is achieved in 1 hr., as against 4-5 hr. of old wood-tray method.

Originally designed for partial drying in dehydro-freezing and dehydro-canning operations, unit has since proved superior in complete drying of such foods as apples, carrots, potatoes, bell peppers, and others.—*United States Steel Corp., 120 Montgomery St., San Francisco.*

Circle 27 on Reader Service Card



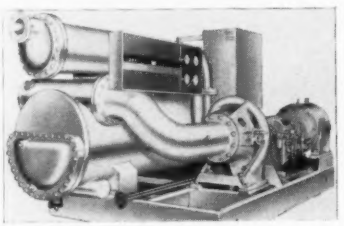
Low-to-High Metering Pump

This new piston-pump unit will inject measured amounts of material —either liquid or slurry—from a low-pressure line into a high-pressure conduit.

Employing a positive displacement ram pump for variable-rate incremental feeding, unit is specially suitable for continuous-process work.

Ram action is such that slurry-type materials are kept agitated. Thus, there is no phase separation, feed remaining in homogenous condition.—*Sigmamotor, Inc., Middleport, N. Y.*

Circle 28 on Reader Service Card



New 350-Ton Chiller

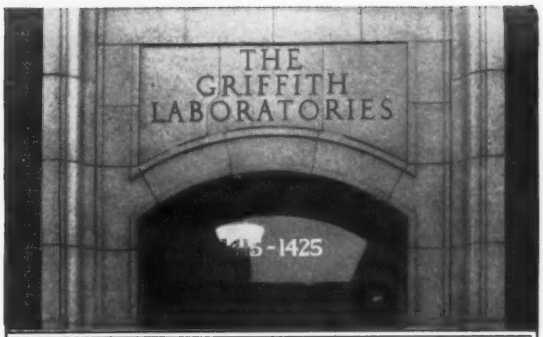
For water-cooling applications up to 350 tons, this packaged centrifugal system incorporates motor starter and all controls, piping, and wiring. Factory-assembled unit (Turbopak) is easily trucked and rigged.—*York Corp., York, Pa.*

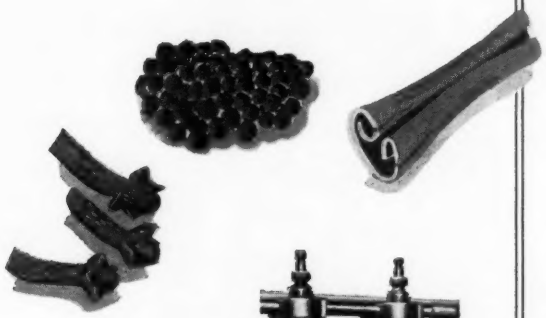
Circle 29 on Reader Service Card

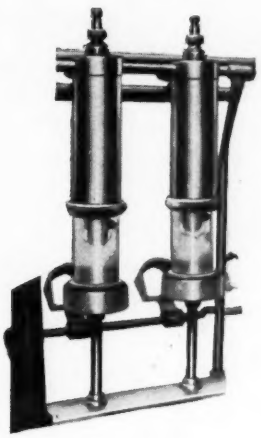
We Control Everything

(everything but nature)

To Bring You The Best in Spices







Our control starts with laboratory evaluation of a sample of the spice under consideration. It must *measure up* to Griffith's standard in both chemical and organoleptic evaluations.

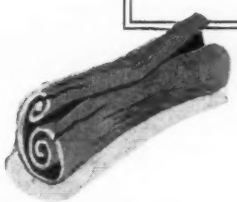
When the shipment of spice arrives, we repeat the evaluation procedure to compare it with the sample.

In storage, the freshness and quality is protected by regulation of light, humidity and temperature.

And grinding is laboratory controlled. The meshes are checked. A "balance" is run—to be sure that spices are being ground to the desired meshes without loss of flavoring.

Last stage of control is packaging. According to the customer's wish: "Bulk," in fiber drums. Or, sealed in cellophane within a batch-size (unit) bag — packed in a fiber shipping drum.

There's more to this story of quality control and how it gives you the best flavor in spices. The Griffith man will tell you about it next time he calls.



Griffith

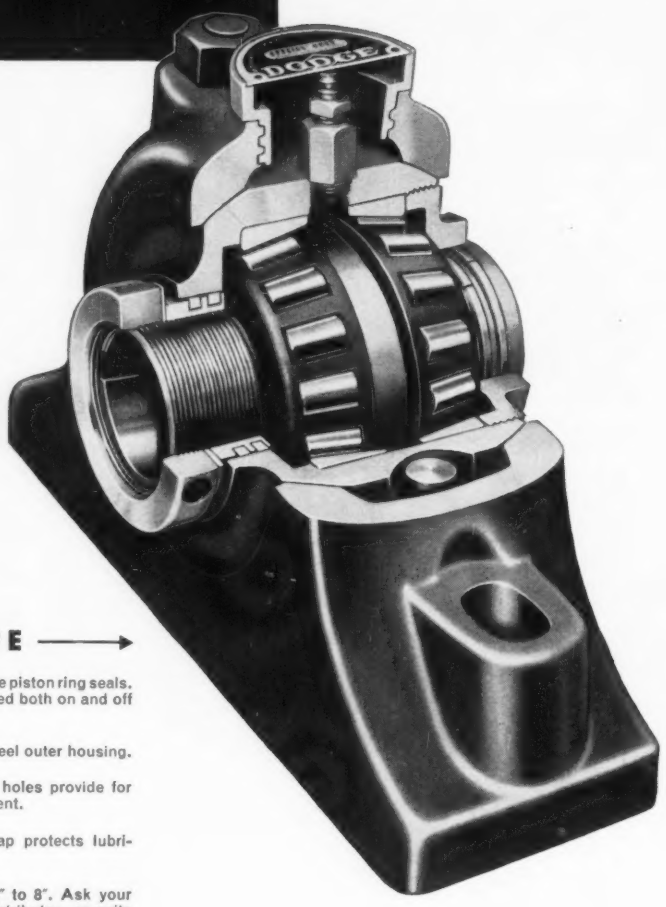
CHICAGO 9, 1415 W. 37th St.
UNION N. J., 855 Rahway Ave.
LOS ANGELES 58, 4900 Gifford Ave.

In Soluble Spices, Pepperoyal is Distinctive for it Contains all of the Pepper Extractive

For more data, circle 308 on Reader Service Card

DODGE PILLOW BLOCKS WITH TIMKEN BEARINGS

America's super-quality line—with a 35 year record of keeping performance *up* and costs *down!* Five types—to fit practically any service condition. All assembled, adjusted, lubricated and *sealed* at the factory for precision performance—long life—dependability.



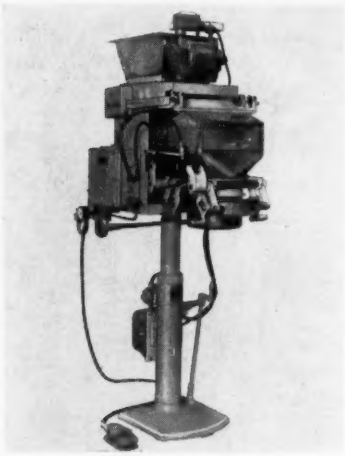
SPECIAL DUTY TYPE →

- Designed for extreme precision and high load capacities.
- Fully self-aligning.
- Special Duplex Timken Roller Bearing with tapered bore.
- Split tapered sleeve with straight cylindrical bore extends through entire length of housing.
- Easy to mount or demount. Adapter nut (or collar) clamps adapter sleeve to shaft with extreme firmness.
- Automotive type piston ring seals. Bearing is sealed both on and off the shaft.
- Rugged semisteel outer housing.
- Elongated bolt holes provide for lateral adjustment.
- Special dust cap protects lubrication fitting.
- Shaft sizes 1¾" to 8". Ask your local Dodge Distributor—or write us for Bulletin A670 giving complete technical data on America's most complete line of mounted bearings.

DODGE MANUFACTURING CORPORATION, 2800 Union St., Mishawaka, Ind.

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look in the *white* pages of your telephone directory for "Dodge Transmissioneer."

DODGE
of Mishawaka, Ind.



Improved Bulk-Bagger

Packing of low-density products bulk-style in bags is sped with use of this improved machine—the Jumbo Packer-Ette.

Here, both supply hopper and feeder tray are larger. Additional employment of an agitator is optional.

Unit is an automatic gross weigher (scale and Powr-Grip bagholder combined). It fills and weighs to ±2½-oz. accuracy.—*Bemis Bro. Bag Co., 408 Pine St., St. Louis.*

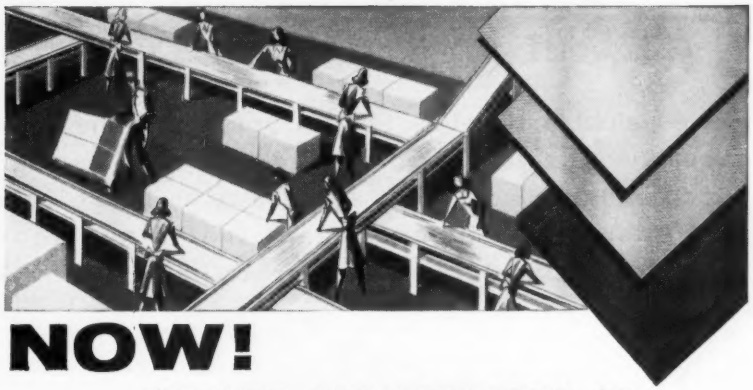
Circle 30 on Reader Service Card

'Package' Process Controller

Designed for regulation and control of processing pressures or temperatures, new compact "package" instrument—the Fultro-Matic—combines functions of measurement, control-point setting, and modulating.

It incorporates adjustable proportional band, control valve, and positive valve positioner. And used with pneumatic transmitters, it controls such variables as rate of flow, liquid level, or 'beyond-range' temperatures and pressures.

Different assembly versions are offered to fit specific applications. Sim-



NOW!

THE MOST HIGHLY PERFECTED OF ALL CONVEYOR BELTING...

GLOBE CHEMIGUM* IMPREGNATED PRESS-CURED KANRY-TEX

* High Acrylonitrile Rubber Latex, — one of the finest in the new field of latex for belting — especially developed for resistance to oil, odor, stain and wear.

THE UNIVERSAL BELT FOR ALL INDUSTRIES

Globe Chemigum Impregnated Kanry-Tex Belting is impervious to fats, oils, greases, alkalies, acids, solvents, juices, moisture and other liquids.

PRESS-CURED

Globe Kanry-Tex is non-porous, easy to clean, odorless, tasteless, non-toxic and non-contaminating.

GLOBE PRESS-CURED KANRY-TEX

is highly resistant to heat, abrasion, wear or color-fading. It maintains stability at zero to 250° F. and has ideal flexibility for small pulley diameters. Special treatment No. 301 is available for sub-zero temperatures.

WHITE, BLACK OR BROWN

in widths up to 60 inches, in 2 to 6 plies. With cleats for incline conveying if desired.

TWENTY YEARS

of research, experience, development and testing by Globe is your assurance of perfection — whatever your conveying problem.

**Chemigum—T. M. The Goodyear Tire & Rubber Co.*

WRITE NOW for characteristics and price list.

MANUFACTURERS OF:

WHITE SOLID WOVEN COTTON BELTING • PRESS-CURED KANRY-TEX BELTING • WATERPROOF AND WAX TREATED BELTING • HYCAR BELTING • NEOPRENE BELTING • PLASCELL BELTING • CELLULOSE BELTING • STITCHED CANVAS BELTING • ROUND BRAIDED ENDLESS BELTS • HEVALOID ENDLESS BELTS • WOVEN ENDLESS BELTS • CLEANER AND SIFTER BRUSHES • WEBBINGS • HOISTING SLINGS • BELT DRESSING

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GLOBE WOVEN BELTING CO., INC.

1400 CLINTON STREET • BUFFALO 6, NEW YORK

KNOWN FOR QUALITY THE WORLD OVER

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FREE...

Five valuable bulletins to help you select the right equipment for your specialized milk processing plant. Each bulletin describes the latest items in the ever increasing line of equipment that Blaw-Knox has developed for the evaporated and dry milk manufacturer.

- ***Check the bulletins you want . . .***
- ***Fill in your name below . . .***
- ***Send it to Blaw-Knox now . . .***

(2) EVAPORATOR

(1) PACKAGE PLANT

INSTANTIZER (3)

(4) ROLLER DRYER

SPRAY DRYER (5)

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☐ Package Plant ☐ Evaporator ☐ Instantizer ☐ Roller Dryer ☐ Spray Dryer

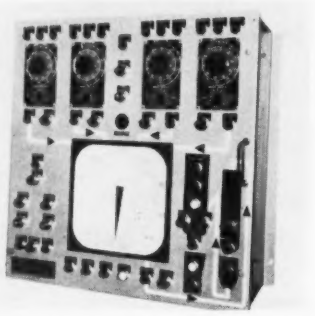
BLAW-KNOX

BLAW-KNOX COMPANY
DAIRY EQUIPMENT DIVISION
MORA, MINNESOTA

Equipment and Supplies

ple, rugged construction minimizes maintenance. — *Robertshaw-Fulton Controls Co., 911 E. Broad St., Richmond, Va.*

Circle 31 on Reader Service Card



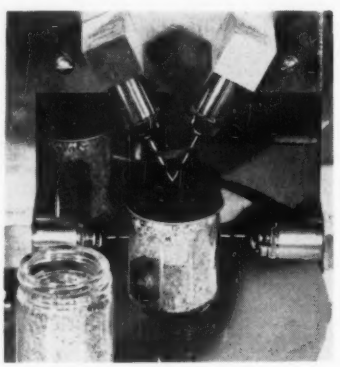
Multi-Scales Ingredients

In a single operation, the new "Select-O-Weight" system proportions up to 500 lb. of each of four different ingredients, as grades of coffee—a total of 1 ton.

Employing wall-mounted control panel (photo), supervision of blending steps is simplified through graphic indication of flow (note lines and arrows).

Panel's weight-selector verniers, controlling material feeders, are arranged in sequence so that proportions may be selected in or out when setting up the batch formula. Once formula is established, proportionate amounts of each ingredient are dialed, then action proceeds automatically.—*Richardson Scale Co., Van Houten Ave., Clifton, N. J.*

Circle 32 on Reader Service Card



'Dual Eyes' Simplify Checks

Special "electric eye" assemblies are now offered for simpler line inspections of moving items.

Specific setups can be arranged to operate either by (1) direct light cut-

POWELL

NICKEL and MONEL* VALVES

for Chemical and Process Industries

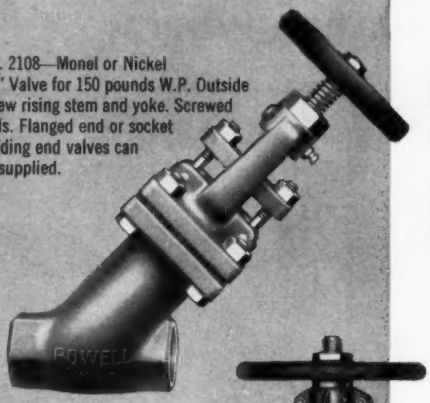


Fig. 2108—Monel or Nickel "Y" Valve for 150 pounds W.P. Outside screw rising stem and yoke. Screwed ends. Flanged end or socket welding end valves can be supplied.

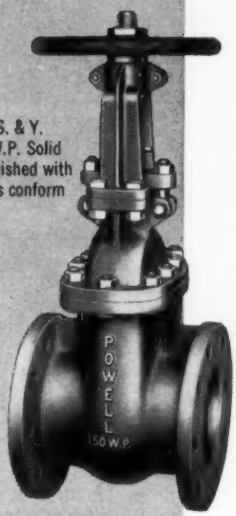
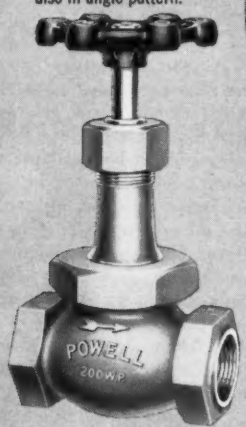


Fig. 2453 SG—Large size O.S. & Y. Gate Valve for 150 pounds W.P. Solid wedge disc. Can also be furnished with split wedge disc. Dimensions conform to latest standards.

Fig. 1836—Monel Metal
Fig. 1839—Nickel
Small Union Bonnet Globe Valve for 200 pounds W.P. Available with screwed, flanged or welding ends; also in angle pattern.



We have produced a wide line of NICKEL and MONEL* METAL VALVES. All are ready for immediate delivery!

When your flow control requirements call for Nickel or Monel* Metal Valves your local Powell Valve Distributor is the man to see. There's one located in all principal cities. Or write to us for complete information.

THE WM. POWELL COMPANY
Cincinnati 22, Ohio
dependable valves since 1846

*Registered Trade Name of The International Nickel Co.

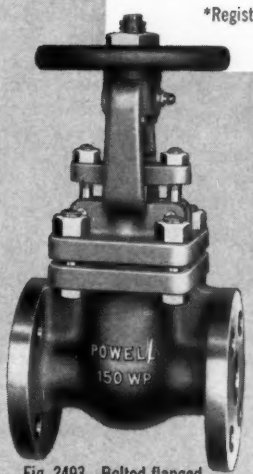
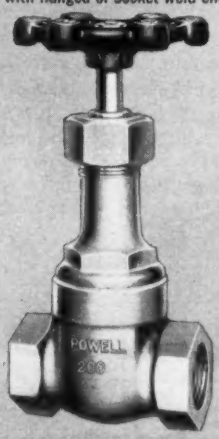


Fig. 2493—Bolted flanged bonnet Gate Valve for 150 pounds W.P. Outside screw stem rises through revolving bushing in upper yoke. Interchangeable solid or split wedge discs. Screwed or socket weld end valves also available.

Fig. 1828—Monel Metal
Fig. 1830—Nickel Inside screw rising stem Gate Valve for 200 pounds W.P. Accurately guided solid wedge disc. Also available with flanged or socket weld ends.



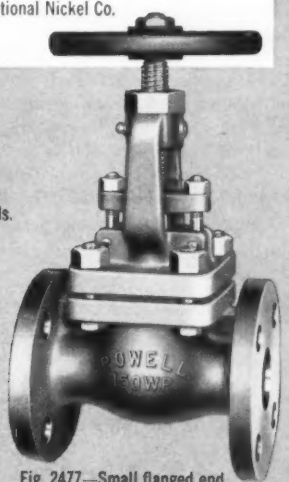
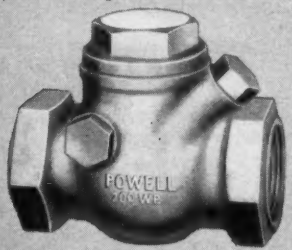


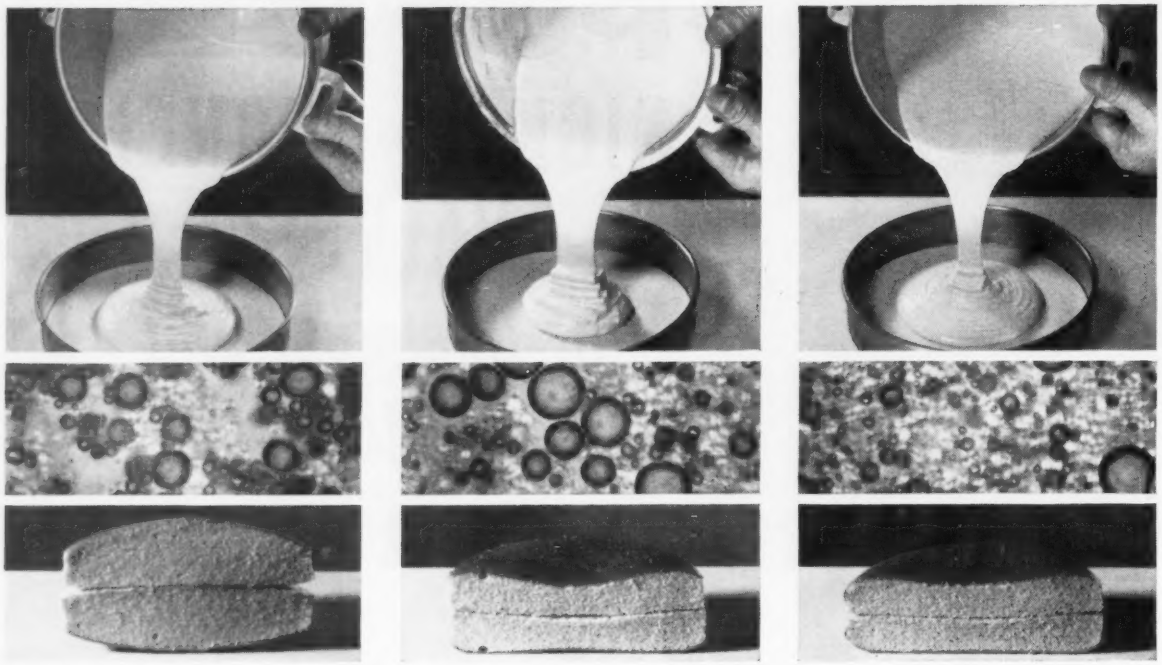
Fig. 2477—Small flanged end, outside screw rising stem and yoke Globe Valve for 150 pounds W.P. Bolted flanged bonnet. Can be furnished with screwed or socket weld ends. Angle Valves available.

Fig. 1843—Monel Metal. Fig. 1845—Nickel. Small size Check Valve for 200 pounds W.P. Screwed-in cap. Has straightway flow area through valve body when disc is in wide open position. Can also be supplied with flanged or socket weld ends.



For more data, circle 312 on Reader Service Card

Cake drama in three acts, starring the emulsifier



I

Curtain raiser Here is a rather thick but pourable batter with a very slight curdle. Below it, a peek into the live batter, one hundred times actual size, reveals a wide distribution of air bubble sizes. Not all the fat has been used up in making bubble walls. Darker areas of reserve fat are seen by the naked eye as curdle. Then, as the relatively weak-walled bubbles gently break during baking, the fat assumes its second role of coating the gluten-and-starch framework. First-act climax: a good cake. Excellent volume, fine and even grain, thin cell walls, whiteness.

II

Plot thickens It's the same formula otherwise, but emulsifiers have been chosen to make a very smooth, very thick batter. In the photomicrograph you see why there's no curdle: all the fat has been used in making big, thick bubble walls. You also see why the batter is so viscous: the big bubbles get in each other's way. Here, alas, the emulsifier builds *too much* strength into the bubble walls. Suspense. By the time the bubbles finally do break, considerable gas pressure has built up. The sudden release of energy shatters the still tender skeletal structure. Tragedy!

III

Anticlimax Now we have swung off to another extreme, using in the same formula emulsifiers that produce a very smooth and very thin batter. Note the small, uniform bubbles floating in a sea of liquid. (There's your low viscosity.) Note the fat all used up in making the bubbles strong. (No curdle.) Finale: in the oven, sudden energy release produces the same collapse as in Act II, with thick cell walls and open grain.

Program note: The offstage voice advancing hypotheses about bubble strength is that of one batter theoretician among many. He has never been inside a cake in the oven.

EPILOGUE: Texture, both of the batter and of the cake, depends on the emulsifier. With *Myverol® Distilled Monoglycerides*, the texture is subject to practical engineering control, regardless of the fine points of underlying theory. Such control is both possible and economical because we, in our own production, have the precise control that comes from segregating fats as vapors. Interested in what we can do for you with this unique power? For particulars, write ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York and Chicago • W. M. Gillies, Inc., West Coast • Charles Albert Smith Limited, Montreal and Toronto.

distillers of monoglycerides made from natural fats and oils

DPi

Also . . . vitamin A in bulk for foods and pharmaceuticals

Distillation Products Industries *is a division of* **Eastman Kodak Company**

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off, (2) reflected beam, or (3) a combination.

In arrangement for checking presence of jar caps (photo), the horizontal beam is inspection timer, reflect beam is monitor. Thus, an uncapped jar is spotted whenever a cut-off of the timing beam (indicating passing of jar) fails to be accompanied by a "reflect" (indicating presence of cap).—*Photomation, Inc., 96 S. Washington Ave., Bergenfield, N. J.*

Circle 33 on Reader Service Card

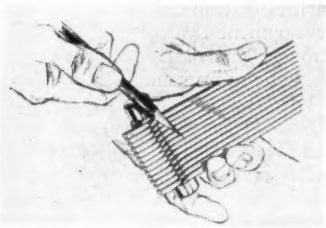
Infra-Red Sample Dryer

Convenient new lab accessory is this infra-red unit for rapid, odorless drying and ashing of organic materials.

It is particularly suitable for treating food samples—such as milk, cream, sauces, and the like—prior to analysis.

Operating on 110v., unit attains required temperature by focusing rays of an infra-red lamp on a crucible supported at the focal point of a gold-plated reflector.—*National Instrument Co., Inc., Baltimore, Md.*

Circle 34 on Reader Service Card

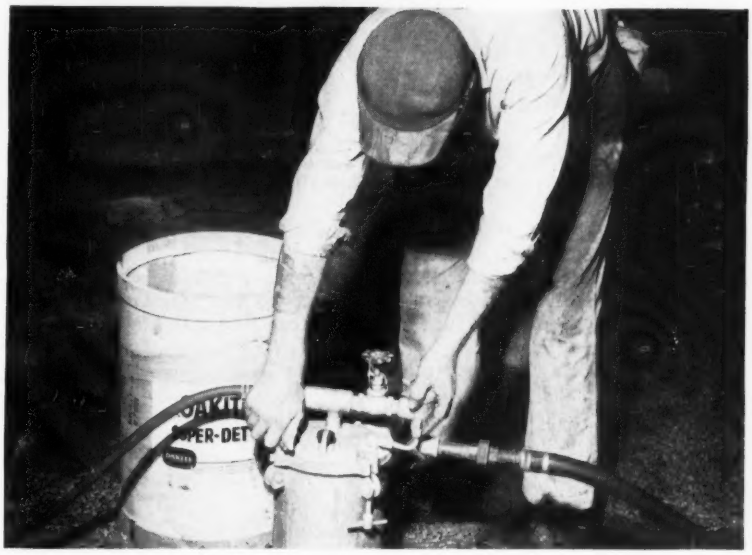


Anti-Blinding 'Taper' Screen

New tapered-slot preparation screen is designed to eliminate blinding when large amounts of "near-opening" size materials are being run.

Screen incorporates series of wedge-shaped wires looped at regular intervals around cross-rods (typical distance between loops 2¾ in.). Opening between wires gradually in-

The big PLUS SERVICE EXPERIENCE RESEARCH PERFORMANCE in Oakite



New Oakite SUPER-DET detergent cleans super-fast, rinses super-clean

This new detergent cuts cleaning time two ways! First, it gives superior wetting-out action: penetrates and loosens stubborn soil in extra-fast time. Second, it rinses without streaking, leaves no dulling film, no "missed spots" that require re-doing.

SUPER-DET is versatile, too. Sweeps through fats, grease, baked-on proteins, syrup, wax, dairy residues and similar food industry soils. Yet, it's completely safe on every type of metal, paint, rubber, plastic—even the most sensitive hands.

The big PLUS in Oakite

Continuing product development is only one of the big plus factors you get with Oakite materials. Others include: the personal assistance of the Oakite man, backed by the vast experience of the entire Oakite organization . . . sanitation methods coordinated to save man-hours and material . . . cost-cutting equipment . . . materials *guaranteed* to perform. Ask your local Oakite man to demonstrate SUPER-DET in your own plant. Or, write for Bulletin B-7139. Oakite Products, Inc., 26G Rector Street, New York 6, N. Y.

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MATERIALS · METHODS · SERVICE
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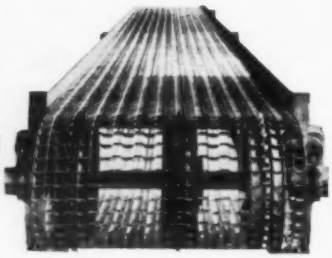

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fully automatic
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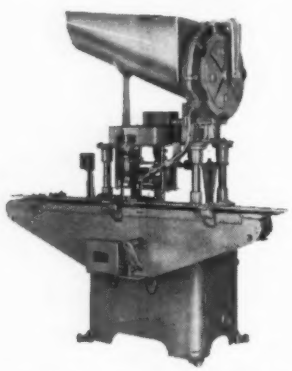
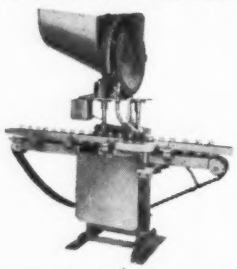


The RESINA line of CAPPERS include models for sorting, feeding and applying a great variety of caps to bottles, jars or cans from ½ ounce to gallons. Speeds available up to 120 per minute.

fully automatic
FITMENT APPLICATOR



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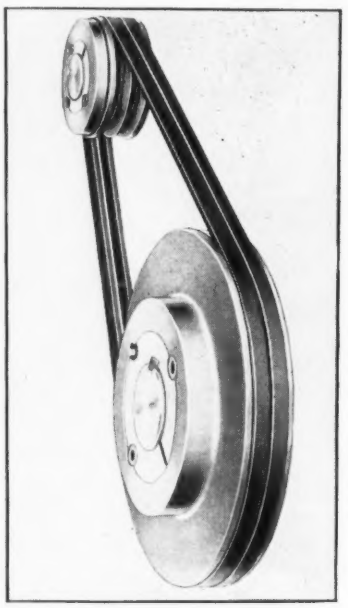
Equipment and Supplies

crease in width between loops (as from .016 to .024).

Thus, material usually tending to lodge is instead transported, with flow of the mass, to the larger end of the tapered slot, where it either passes through or becomes loose and continues on with the flow. In this way, pile-ups are eliminated and screening efficiency increased.—*Wedge-Wire Corp., Wellington, Ohio.* Circle 35 on Reader Service Card



V-Belt Drives Cut Costs

Substantial savings in space, weight, and cost of power-transmission equipment are offered by a new line of V-belt drives covering the complete range of horsepower capacities of conventional units. This development is attributed to use of stronger metals for sheaves, and synthetic rubbers and fibers for belts.

For most applications, units (Dyna-V) employ ⅜-in.-wide belts, and sheaves greatly reduced in both width and diameter. The smaller and lighter sheaves, employing maker's bushings (Taper-Lock) for quick and secure mounting, also tend to prolong bearing life.

Drives are available in two standard groove sizes, ⅜- and ⅝-in. nominal top width. Sheaves in the former series (3V), with 1-10 grooves, are for drives ranging 50 hp. A 5V series with sheaves taking 3 to 10 ⅝-in. belts handles drives up to 200 hp.—*Dodge Mfg. Corp., Mishawaka, Ind.*

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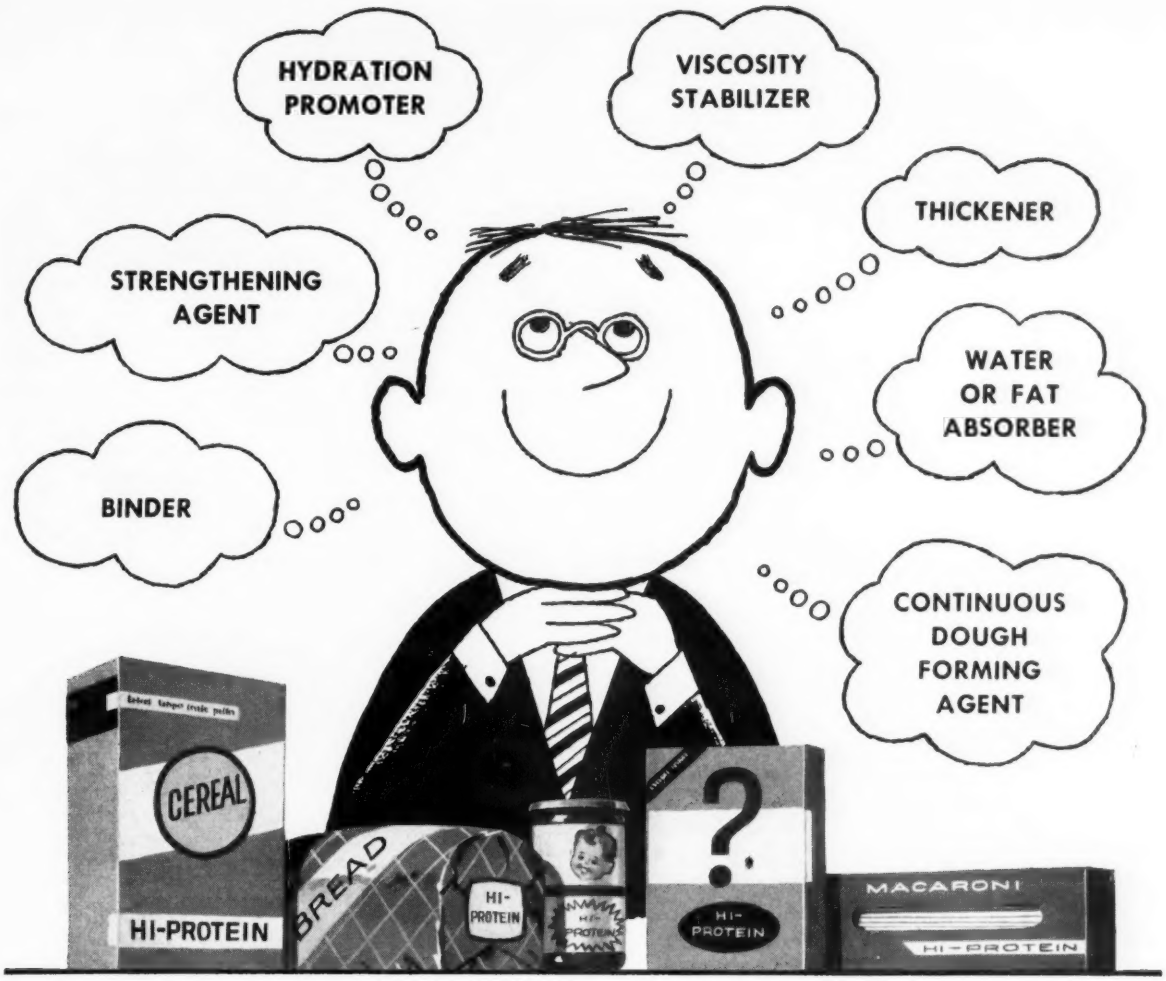

PRO-80 gives you all these processing benefits ...plus 80% wheat protein for food enrichment

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Thickening, strengthening, binding and other functions of Pro-80 Vital Gluten give you numerous opportunities to overcome production problems—or, to create entirely new food products and improve existing ones.

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As a low cost source of concentrated protein, Pro-80 is ideal for enrichment of numerous foods. And, with shoppers becoming increasingly conscious of health and diet, protein enrichment is more of a sales stimulant than ever.

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Some processors already have found profitable uses for Pro-80 in:

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- cereals
- dog food
- health foods
- baby foods
- baked foods
- many others

Its potential merits investigation in many other food fields.

PRO-80 IS 80% PROTEIN Pro-80 Vital Gluten (80% pure wheat protein on a moisture-free basis) blends smoothly, hydrates rapidly, is bland and compatible —adds no taste or odor of its own. Packed in 100-lb. multi-wall paper bags.

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Nash Compressors have no valves, gears, pistons, sliding vanes or other enemies of long life. Compression is secured by an entirely different principle of operation, which offers important advantages often the answer to gas handling problems difficult with ordinary equipment.

Nash Compressors are compact and save space. They run without vibration, and compression is without pulsation. Because there are no internal wearing parts, maintenance is low. Service is assured by a nation-wide network of Engineering Service offices. Write for bulletins now.

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No valves, pistons, or vanes.

No internal lubrication.

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Saves floor space.

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75 pounds in a single stage.

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Specially resistant coating for food processing plant floors and walls is new Penntrowel, reported exceptionally resistant to acids, alkalis, abrasive wear, and weathering. Supplied in a three-component package (resin, hardener, and inert filler), product mixes to butter-like consistency for ready troweling onto concrete, brick, or cement surfaces. Three grades are offered—regular, carbon, and floor-surfacing—to insure highest performance in the specific applications.—*Pennsalt Chemicals Corp., Natrona, Pa.*

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Grout That Takes 11,000 Psi.

Use of a special aggregate—Cortland emery, a form of corundum—is feature of a new non-shrinking grouting material for firm seating of machinery and structural members. Called Emeri-Grout, product has stood up under 11,000-psi. compression, says maker. Plasticity before setting permits ready working into restricted spaces without honeycombing or formation of water pockets.—*Walter Maguire Co., Inc., 60 E. 42nd St., New York City.*

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New High-Impact Epoxy

Latest liquid epoxy resin, Epon X-81, has been developed to withstand constant temperature changes and heavy impact loads. Key applications: Concrete-to-concrete bonds, caulking and sealing compounds, encapsulating of electrical components.—*Shell Chemical Corp., 50 W. 50th St., New York City.*

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BRIEFS

Film-Bag Packaging on Verti-Pak unit now features automatic hairline weighing accuracy through addition of advanced sealing device.—*Mercury Heat Sealing Equip. Co., 2601 N. Howard St., Philadelphia.* (40)

Polymer Linings for Wood Tanks are cited as long-lasting and economical. They are furnished for both round and rectangular tanks, either new or in use, and further may be custom-made for particular needs.—

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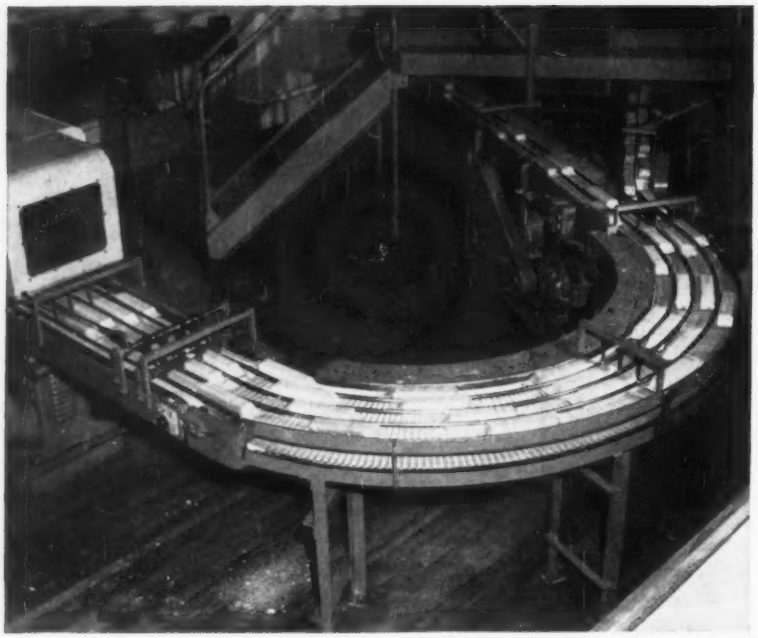
Industry Moves



Crackers turn corners on an Ashworth Belt

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Every industry has its product flow problem; frequently, it's one of "getting around a corner". Around the corner or straightline travel . . . whether it's crackers, popcorn, candy or nuts and bolts . . . there's an Ashworth Metal Process Belt to solve the problem.

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Equipment & Supplies

Wendnagel & Co., Inc., 600 W. Cermak Rd., Chicago. (41)

Heat-Transfer Units in advanced Platecoil line employ new "Multi-Zone" branched-conduit header design. Thus, steam is carried simultaneously to all parts for faster, more uniform heat distribution.—*Tranter Mfg. Co., Inc., Lansing, Mich.* (42)

Scotch-Tape Dispenser-Printer adds code date or small message on tape. Printing is on sticky side in reverse type.—*Kiwi Coders Corp., 4027 N. Kedzie Ave., Chicago.* (43)

Refrigeration Compressors, integrating hermetic and direct coupled drive units, are specially designed for quiet performance. Operation is at Optimum 1,750 rpm. Six sizes available, 15 to 80-ton capacity.—*Worthington Corp., Harrison, N. J.* (44)

Midget Steam Generator (Series "R") gives high-pressure service despite portable size. With accessory gun kit, it readily converts for use as stream-jet cleaner.—*Pantex Mfg. Corp., Pawtucket, R. I.* (45)

Reaction Torque Motor Base is designed for automatic belted drive tension control under changing load conditions. Of tilting type, it's specially compact for most efficient use of space.—*Allis-Chalmers Mfg. Co., Milwaukee, Wis.* (46)

Fluorescent Lamp that is called "the most powerful" will be available in a few weeks. An improved version of Power-Groove unit, it's stated to give 15% more light while only using 7% more current.—*General Electric, Nela Park, Cleveland.* (47)

Dual-Length Tape Dispenser (Model 98 Electric Tayper) selectively supplies two different strips, 4 to 72 in., for package-sealing lines. Action is either by pushbutton or foot-switch.—*Package Sealing Div., Nashua Corp., Nashua, N. H.* (48)

Seal-Less Strapping Device now has improved lever controls for greater working ease.—*Inland Wire Products Co., 3947 S. Lowe Ave., Chicago.* (49)

Improved Insecticide Fogger incorporates new timer and advanced temperature control for more efficient fog dispersal.—*Aero-Master, Inc., 325 W. Pacific Ave., St. Louis.* (50)

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Continuing research has proved new air purification system for hospitals

effective new technique

An effective new technique—positive air purification by Kathabar Systems—gives hospitals a potent weapon in their running battle against pathogenic organisms.

The quantitative removal of bacteria by Kathabar Systems has been established in over 4 years of tests by the Research Foundation of the University of Toledo, using instrumentation which is 99% effective in air sampling.

These tests show that Kathabar equipment removes 97% of all airborne micro-organisms in the contacted air stream. Applicability of this equipment has been proved in over 10 years of use by food and pharmaceutical plants and in comfort installations.

limits bacteria population

The continuous removal of 97% of the organisms entering a Kathabar unit has been confirmed by actual hospital readings. This means that a Kathabar System can guarantee that not more than 5 organisms per 10 cubic feet can enter an operating room. Test readings, as close as 6 inches to open wounds, have shown an average pick-up of less than 5 organisms per 10 cubic feet.

Added to its bactericidal efficiency, a Kathabar System will provide desired cooling for a hospital operating suite, when supplied with refrigeration energy. It will humidify or dehumidify as required.

new hospital specifications

These facts indicate that, with a Kathabar System, a hospital can specify the following conditions for its operating suites:

1. Temperature: to be controlled at 72-76° F.

2. Humidity: to be maintained at a minimum of 55% RH.

3. Micro-organisms: rooms to be maintained at a maximum of 10 organisms per 10 cubic feet (as measured by the 99% efficient all-glass impinger).

A Kathabar System is not dependent on filtering, nor is it an aerosol. It simply washes the air with a germicidal solution totally contained within the unit. Micro-organisms are entrapped in the solution by impingement on the contact surfaces.

odorless, stable, constant

The solution itself is odorless and non-volatile. Its effectiveness is constant, regardless of age or whether the unit is humidifying or dehumidifying.

Kathabar Systems are completely automatic and continuous. They are available for both operating room and complete hospital air purification.

how can you obtain more data?

Write to Surface Combustion Corporation for full information.

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The Vital Story of Vitamin A (continued)

New Expanded Edition

The Vital Story of VITAMIN A

by Science Writer

THE "FIRST" VITAMIN

Vitamin A was probably the first to be discovered. As early as 1909 Hopkins and Stepp found that certain fat-soluble substances were necessary for the growth of mice and rats. Between 1913 and 1915, working independently, the teams of McCollum and Davis, and Osborne and Mendel revealed the existence of a fat-soluble fraction in butter, egg yolk and cod-liver oil, which was essential for the growth of laboratory animals. McCollum and Davis concluded that the unknown substance was organic in nature. They had, in effect, discovered vitamin A, even though they did not so name it.

An interesting point: McCollum and Davis noted that the word "vitamine," coined by Casimir Funk a year or so previously, might be used to describe the growth factor they had found. Subsequently, McCollum (and Kennedy) reversed this opinion and suggested that the unknown substances which induced growth be called *fat-soluble A* and *water-soluble B*. In their opinion these phrases better described the unknown factor. Casimir Funk disagreed, however, pointing out that, to be truly descriptive, the phrases should read *growth-promoting fat-soluble A*, etc. This obviously being cumbersome, Funk suggested the designations: vitamine A, vitamine B, and so on. These (with the final "e" omitted) are now firmly embedded in the language.

Other investigators worked on the problem of carotene, beginning in 1831 when Wackenroder isolated that substance from carrots. We shall see later how vitamin A and the carotenes, particularly beta carotene, are interrelated.

TRACKED DOWN

Various tries at isolating vitamin A were made in the 1920s. Investigators in Japan and England attempted without success to extract the elusive vitamin from cod-liver oil.

After establishing the structural formula of beta carotene, Paul Karrer of Switzerland turned his attention to vitamin A. He and his colleagues, using halibut-liver oil (which has a much higher potency than cod-liver oil) succeeded in determining the structure of the vitamin A molecule in 1931.

WHAT IT IS

Pure vitamin A crystals are pale yellow in color. They are soluble in fat and in fat solvents but not in water. The chemist's formula is $C_{20}H_{30}O$, expressing the vitamin's composition of carbon, hydrogen, and oxygen. Beta carotene has the formula $C_{40}H_{56}$.

Vitamin A is stable to light and heat, but is destroyed by oxidation and ultraviolet light.

Two vitamins A have been discovered. Vitamin A_1 occurs in animal products such as egg yolk, liver, butter, and in the livers of salt water fish. Vitamin A_2 is found in fresh-water fish livers. As now used by pharmaceutical and food manufacturers, vitamin A is in liquid form — in solution in edible, vegetable oil — or in dry granular form in which tiny droplets of the liquid vitamin are encased in a dry, edible material.

ACTION

Human beings receive their vitamin A from many sources. They eat vegetable foods rich in beta carotene (a provitamin A) which is then converted by the body into a vitamin. They eat animal products which contain the vitamin. They eat processed foods which are fortified with beta carotene or vitamin A or both. They use pharmaceutical preparations of the vitamin, with or without other vitamins, for therapeutic or protective effect.

The liver has been found to be the main storage site of vitamin A. It is also lodged in the kidneys, lungs, adrenal glands, and body fat.

It is believed that provitamins A are converted to the vitamin in the intestinal wall, the liver, and other parts of the body through the action of the enzyme called carotenase.

Vitamin A is absorbed primarily in the healthy intestine and is carried in the lymph and blood to the body's storage depots.

HOW MUCH DO WE NEED?

According to the Food and Nutrition Board of the National Academy of Science — National Research Council, in its 1958 publication #589, vitamin A is needed daily (in various amounts depending on age and sex) to maintain good nutrition of healthy persons in the U. S. A. The following table expresses the Board's recommendations in International Units of the vitamin.

NATIONAL RESEARCH COUNCIL RECOMMENDATIONS FOR DAILY VITAMIN A INTAKE

Men (all ages)	5,000	Children (1–3 years)	2,000
Women (all ages)	5,000	Children (4–6 years)	2,500
Women (pregnant, second half)	6,000	Children (7–9 years)	3,500
Women (lactating)	8,000	Children (10–12 years)	4,500
Infants (2–6 months)	1,500	Boys (13–19 years)	5,000
Infants (7–12 months)	1,500	Girls (13–19 years)	5,000

The Food & Drug Administration of the U. S. Department of Health, Education and Welfare has set the following standards as being the *minimum* daily requirement. In other words, these amounts are the *least* which can be ingested to prevent recognizable signs of deficiency disease from developing. There is an opinion among nutrition experts that the *minimum* amount of a vitamin is not necessarily the best criterion.

F. & D. A. *MINIMUM* DAILY REQUIREMENTS OF VITAMIN A

(Measurements in U. S. Pharmacopeia (U.S.P.) units which equal International Units)

Men and Women	4,000	Children (1–11 years)	3,000
Adolescents (12–19 years)	4,000	Infants (to 1 year)	1,500

The Vital Story of Vitamin A (continued)

DEFICIENCIES AND MEDICAL USES

Correcting a vitamin A deficiency has little of the instant, dramatic impact that, for example, vitamin C has in curing scurvy.

Because of the body's ability to store quantities of vitamin A which are released as needed, a considerable time passes before the vitamin A deficiency develops.

Lack of enough vitamin A shows itself in several ways.

"Dark adaptation" of the eyes is diminished. Go from a brightly lighted place to one which is dim or dark; notice how your eyes need a few moments to adjust. This is known as *dark adaptation*. With vitamin A deficiency, the power of the eyes to make the adjustment quickly and completely is lessened, sometimes severely or dangerously.

The skin, too, becomes dry from lack of vitamin A. The linings of the hair follicles harden and become plugged, thus interfering with the secretion of the skin's oil glands.

Other epithelial tissues, such as the linings of the upper parts of the respiratory passages, the genito-urinary tract, the alimentary canal, may not function properly.

Vitamin A is necessary for growth. When children fail to gain weight a deficiency of the vitamin may be suspected.

Physicians treat the deficiency states with therapeutic doses of the vitamin. To prevent their development or recurrence they may prescribe supplementary dosages.

MICROGRAMS, U. S. P. UNITS, INTERNATIONAL UNITS

The measurement of vitamin A is made in *International Units* which may be abbreviated as I.U. or i.u.

One International Unit of vitamin A is equivalent to:

— 0.344 microgram of crystalline vitamin A acetate.
— 0.300 microgram of crystalline vitamin A alcohol.
— the activity of 0.6 microgram of pure beta carotene.
— one U. S. P. unit of vitamin A.

In everyday measurement, one ounce equals 94,500,000 International Units of vitamin A alcohol.

Vitamin A is available to pharmaceutical and food manufacturers in forms having standardized potencies as, for example, liquid products containing 1,000,000 units per gram or dry beadlets having 250,000 or 500,000 units per gram.

MEASURING VITAMIN A

The best known and most commonly used method of measuring vitamin A is the Carr-Price spectrometric assay. In this chemical test a measurable blue color appears when a reagent (antimony trichloride) is added to the vitamin. The so-called "blue value" when measured photometrically can be converted by a mathematical formula into International Units of vitamin A.

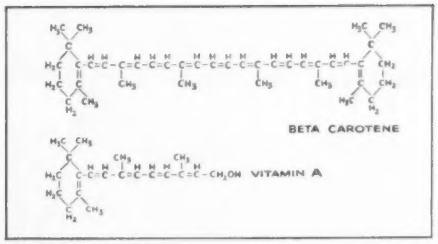
PROVITAMIN AND VITAMIN

The carotenes and vitamin A are known to be closely related. The former are known as precursors, or *provitamins*. It is one of nature's singular facts that the carotenes contain no vitamin A and yet have important vitamin A value. The body has a mechanism by which carotene is converted to vitamin A.

Four carotenoids: alpha-, beta-, and gamma carotene, and cryptoxanthin are known to be provitamins A. Of these, beta carotene is the most valuable in supplying the vitamin's value. The carotenes exist as colors in vegetable material. Example: carrots from which the word "carotene" was derived.

The chemical formulae of the carotenes show their relationship to vitamin A. This is demonstrated in the diagram that follows showing vitamin A and beta carotene.

Theoretically, one molecule of beta carotene could be expected to yield two of vitamin A. Actually this efficiency of conversion is not normally achieved in the human body.



GOOD SOURCES

Margarine, which has been fortified with vitamin A or with a combination of the vitamin and beta carotene (for safe coloring, plus nutritional value) supplies important amounts in our daily diet. Butter, too, can be a valuable source. It contains vitamin A in quantities which vary as the dairy cows' diet varies between seasons. Another good source of vitamin A is beef or calves' liver.

There are many foods which contribute vitamin A value through their supplies of the carotenes. Among these are apricots, beet greens, broccoli, carrots, kale, spinach, sweet potatoes, and turnip greens.

MOSTLY, IT'S MADE

After the chemical composition was determined by Paul Karrer and the product was crystallized by Holmes and Corbett, many attempts were made to synthesize the vitamin. The most successful, that of the Roche research team headed by Otto Isler, supplies a large portion of the world's requirements.

Vitamin A is also extracted from natural sources such as the liver of fish. Esthetically and practically, however, synthetic vitamin A has been found the most satisfactory for products used by human beings.

The U. S. production of synthetic (man-made) vitamin A is measured in tons. This huge annual production is enough to supply daily 170,000,000 people, the total population of the United States, with the 5000 international units (recommended by the National Research Council for daily adult intake) and still have enough synthetic vitamin A left over for use in animal feeds, pet foods, for export, etc. Of course, not everyone does receive his daily requirements through the medium of manufactured vitamin A. Yet, the *potential* is always there.

Pure beta carotene, so closely allied with vitamin A, also is man-made in large amounts for use in safely coloring and fortifying foods. Since it was first synthesized in Roche research laboratories, beta carotene Roche has been produced in ever-increasing quantities to meet the demands of the food industry for safe, sure, economical, yellow color with nutritional value as a bonus.

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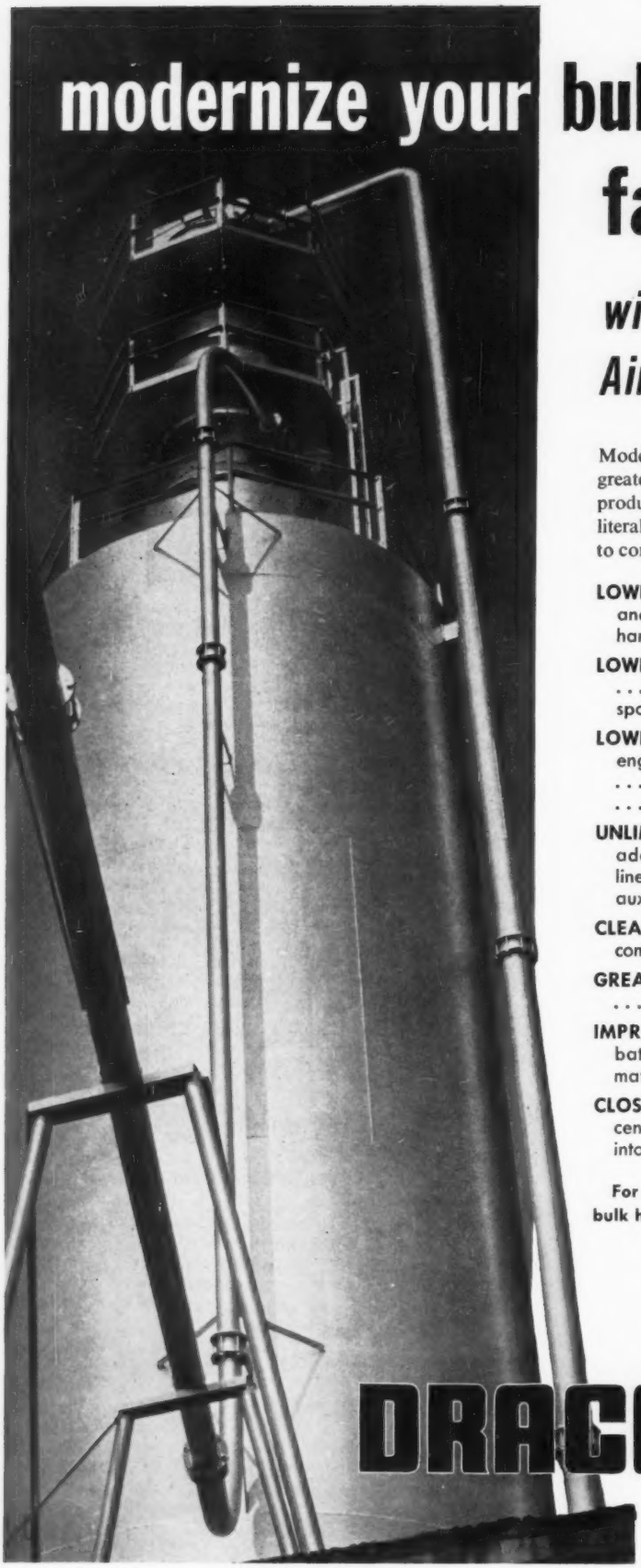

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LOWER LABOR COSTS with automatic operation and one-man supervision . . . no costly manual handling . . . no extra or unnecessary handling steps.

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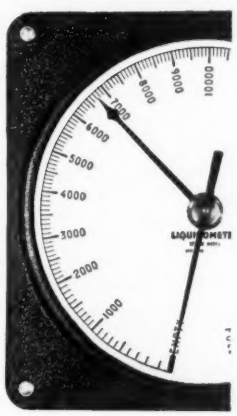

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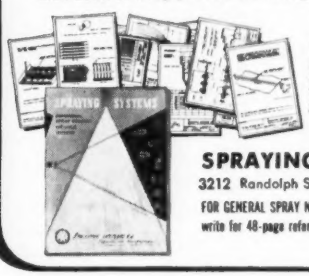

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Mack Model N's (trucks or tractors) are meeting today's exacting demands for local haulage of all kinds, as well as for specialized types of highway service. Choice of high performance Mack engines—gasoline or diesel. Tilt-action cab for full, fast engine accessibility. Low step-height for easy entry-exit. Set-back front axles for 1/3:2/3 weight distribution on trucks and maximum front-axle loading on tractors. Choice of 5- to 15-speed Mack transmissions. Four- or six-wheel models with option of famous four-wheel rear-drive Mack Balanced Bogie.

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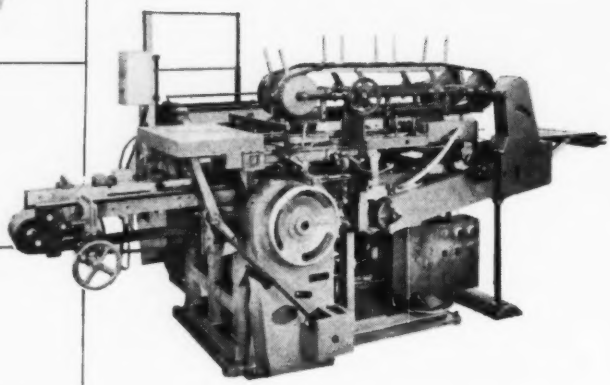

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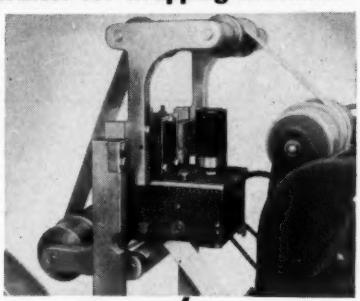

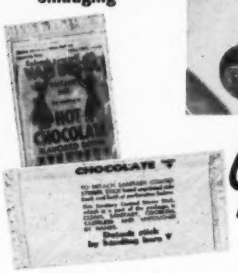

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All product contact areas; feed inlets, discharge outlets, screens, rotor and blades are stainless steel. Exclusive snap-apart design permits easy disassembly in two minutes. Separation of bearings from the processing components eliminates any possibility of greases mixing with product.

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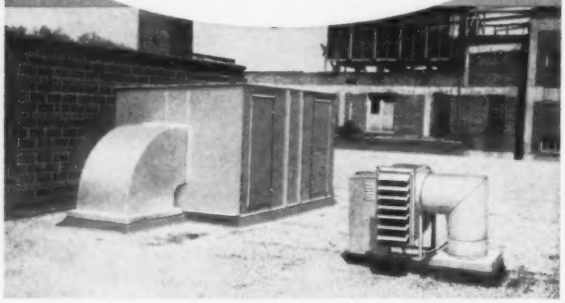
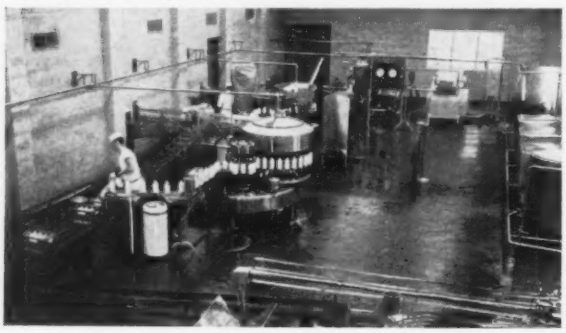
Solves Air Problems at Flynn Dairy



Klimatic King units and King utility blowers are installed on the roof at Flynn Dairy Plant, Des Moines, Iowa.



Fresh air supply grills are seen along one wall of the milk processing room.

- **No more Excess Humidity**
- **Odors Eliminated**
- **Never a Dust Problem**
- **Continuous Air Circulation**
- **Maintain Constant Temperatures**

Flynn Dairy of Des Moines, Iowa has installed Klimatic King heating and ventilating units which are especially engineered for dairy and food processing applications.

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Cooling, Ventilating and Heating Systems

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ready-to-use product for propagating lactic cultures. 4p.—Lab-Lac, Carnation Research Laboratories, Van Nuys, Calif. (113)

Flavors. Prices and other details on company's line of flavor.—F. Ritter & Co., Los Angeles. (114)

MANAGEMENT

Company Profile. Presents customer-oriented view of prominent corporation. Surveys its engineering, manufacturing, and research facilities, records past achievements projects future research. 24p.—Pfaudler Co., Rochester, N. Y. (115)

Univac. Explains techniques of processing unit facts, illustrating broad range of functions specific equipment to execute them.—Remington Rand, N.Y.C. (116)

Plant Site. Outlines area advantages. — Greater Johnstown Chamber of Commerce, Johnstown, Pa. (117)

New Accounting Machine actuated by 10-keyboard, punches 2 quantities of cards, accumulates and prints detail tape. Later, reads inner punches on cards, adds or subtracts, prints results on tape. 4p.—Royal McBee Corp., Port Chester, N. Y. (118)

Quantity Recipes. Presents 65 dishes made with canned apple products that help food operators save labor and trim food costs.—Processed Apples Institute, Inc., New York, N. Y. (119)

Distribution Center. Describes 12-unit public warehouse in Dallas/Fort Worth area. Great Southwest Distribution Center, Arlington, Tex. (120)

North Carolina Opportunities. Cites outstanding advantages of the state for plant location. Gives facts about natural resources, taxes, culture and education, and economic development. Introduces campaign to promote food industry. 20p.—N. C. Dept. of Conservation & Development, Raleigh, N. C. (121)

Counter-Totalizer. Discusses use of new batch weight recording unit for automatic inventory system. Photos demonstrate functions. 2p.—Richardson Scale Co., Clifton, N. J. (122)

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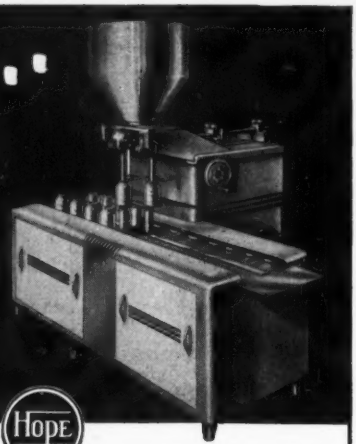

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- Diagonal filling saves space, easier handling
- "No container-no fill," each line
- Accurate positioning
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Rodney Hunt Turba-Film Processor, installed at California Packing Corp., San Leandro, Calif., processes pears and apricots at a rate of 5 tons an hour. Foxboro instrumentation precisely controls steam jacket pressure and absolute pressure — makes certain quality and flavor of concentrate will not be damaged by overheating.

Behind the Del Monte quality label

FOXBORO AUTOMATIC EVAPORATOR CONTROL

Five tons of fruit an hour — that's the rate at which California Packing Corp. runs its Turba-Film processor during peak season. And Foxboro Automatic Evaporator Control helps make sure every last spoonful of production lives up to the Del Monte reputation of quality in food products.

Crucial point in many food processing operations comes at the evaporation stage. Too much heat; too high a steam pressure; too slow a product flow; too dense a concentrate — and quality and flavor may be seriously impaired. Foxboro instrumentation integrates and controls all these functions — provides the high degree of accuracy and sensitivity needed for the most efficient operation of processing equipment.

Faster operation and better product quality are just a few of the benefits gained when a food process is equipped with Foxboro Automatic Control. Have your Foxboro Field Engineer survey your process with improved instrumentation in mind. Your product may be the winner for it. **The Foxboro Company, 303 Neponset Ave., Foxboro, Mass.**

FOXBORO REG. U.S. PAT. OFF.

INSTRUMENTATION FOR THE FOOD INDUSTRY

Make and Market
Your Product with
Maximum Efficiency
for Greater Profits

Now Available
Without Capital Investment

LARGE MODERN PLANT

Completely Staffed and Managed, and Owners Will Fully Equip
to Manufacture, Process, Package
Special Foods, Pharmaceuticals, Drugs, Chemicals, Biologicals
and related products and materials

Economically and Centrally Located in Midwest U. S. A.
to save country wide shipping costs

Modern Plant Facilities:
34,000 square feet including sanitary, all-tile processing rooms

- Cooler storage for perishables
- Clean dry storage for supplies
- Sanitary processing area
- Shipping docks—rail and truck
- Large capacity steam and refrigeration if needed

Trained, Experienced Management Abilities:

- Full production personnel
- Management successful with labor
- Research and technical specialists
- Reliable work force in dependable supply at reasonable wage rates

Owners have top financial ratings. Desire to contract with soundly established firm under exclusive and confidential manufacturing arrangements.

Will Install Any Additional
Processing Equipment Needed
No capital investment required
Get full facts fast
Write or wire today
Chief Executive of Company
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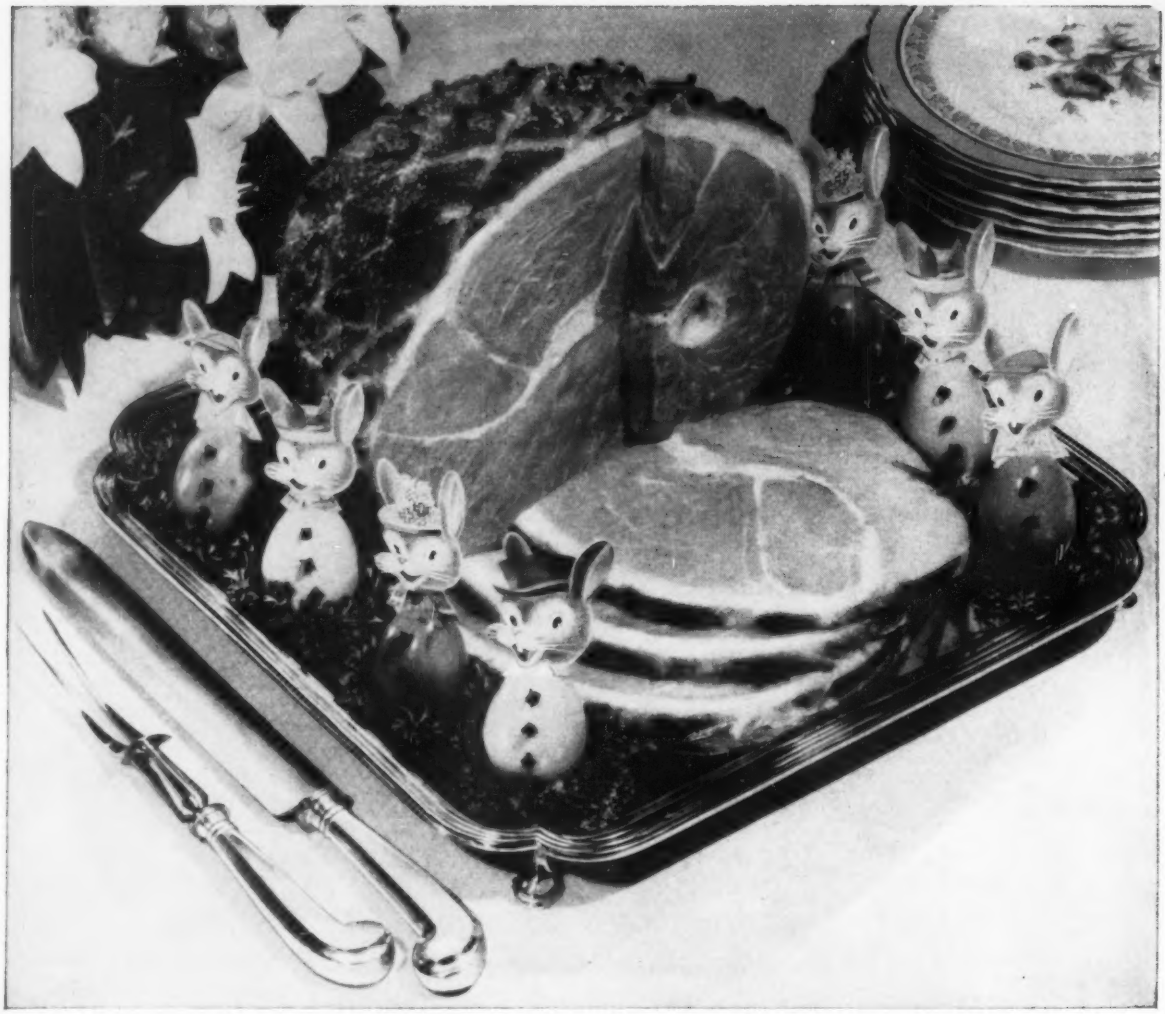
Times Square Station, New York 36, N. Y.



BUILD UP YOUR OLD-FASHIONED, COUNTRY-CURED FLAVOR WITH HVP®

HVP is Hercules hydrolyzed vegetable protein —a product that is causing more and more food processors to take a new look at their formulations.

In baked ham, for example, HVP adds a hint of a distinctive new taste reminiscent of the old, slow-cured country hams. Manufactured from nutritious wheat, HVP in liquid form can be easily added to regularly prepared cures to add a pleasant and distinctive flavor.

In sausages, as well, a little HVP makes a big difference. That's why we say "Do your flavor a favor" with HVP. We'll be glad to provide any food processor with full information on HVP.

HVP®

Huron Milling Division • Virginia Cellulose Department

HERCULES POWDER COMPANY

INCORPORATED

900 Market Street, Wilmington 99, Delaware

MANUFACTURERS OF MSG, AGE-IT®, WHEAT GLUTEN AND WHEAT STARCH

For more data, circle 336 on Reader Service Card

USEFUL NEW BOOKS

New Candy Reference

ALL ABOUT CANDY AND CHOCOLATE. *By Philip P. Gott and L. F. Van Houten. Published by National Confectioners Assn., 36 South Wabash Avenue, Chicago 3, Ill.* 1958, 208 *pages. Price:* $4.50.

If you're interested in a good clear picture of the $2¼ million candy business, this is your book. Readable and informative, it traces the history of candy through 40 centuries.

In addition, the reader is guided along the path of the major candy processes, from raw material to merchandising. Of particular interest are sections on the chemical properties of candy.

Safety Program's Key Man

SUPERVISOR'S SAFETY MAUNAL. *Published by National Safety Council, 425 N. Michigan Ave., Chicago* 11. 1956. 354 *pages. Price:* $3.75.

The supervisor — management's link with the working force—is the key figure in the safety program of any plant. By efficient safety training and insistence on safety working procedures, the supervisor can greatly reduce losses caused by accidents.

Written by staff engineers of the National Safety Council, this manuel can serve as a basic guide for the supervisor, either in self-study or group training. It covers such topics as the human element in safety, health and first aid, protective equipment, fire prevention and control, and materials handling and storage.

Included with the manual is a 32-page Instructor's Guide, a booklet which may be used to help you plan and conduct a training course.

One for The Lab Man

BIOCHEMICAL ENGINEERING *by R. Steel, published by The Macmillan Co., 60 Fifth Ave., New York City* 11. 1958. 328 *p. Price:* $7.50.

Industrial application of biochemical processes is a combined effort of the biochemist, microbiologist, geneticist and chemical engineer. Each must understand the others' problems and the limitations posed by factors outside his normal consideration.

This book provides an authorative birds-eye view of biochemical engineering that fills this need for a manual.

INCREASE VOLUME . . . DECREASE COST

with a YORK FOOD *Rotary Portion Former*

If your product must be FORMED in high volume at a minimum of cost . . . particularly if it is a POTATO or FISH item, investigate the advantages of the York Food ROTARY PORTION FORMER.

Used by many of the leading food processors and packers in the nation, the York Food ROTARY PORTION FORMER produces portions of extremely accurate weight, size and shape **without** extruding. Vacuum forming prevents damage to even the most delicate ingredients, as many large confectionery manufacturers have demonstrated by their use of the ROTARY PORTION FORMER.

Cost-cutting capacities available up to 2500 lbs. of material per hour; 1800 small pieces per minute.

FREE BROCHURE gives all the facts. Send for your copy today and give us details of your requirements.

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COLUMBIA, PA. PHONE: MUtual 4-2138

Subsidiary of JOHN C. MOTTER PRINTING PRESS CO.

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Prompt service to belt users is assured by two factories, one in the Middle West and one on the Pacific Coast.

Cyclone Fence Dept.
American Steel & Wire
Division of
United States Steel

USS

Manufactured at Waukegan, Ill. and Oakland, Calif.
Sales Offices, Coast to Coast

CY BELT says

"I can eliminate 'time lag' and speed production!"

Too often material in process can go only so far, and then must wait until somebody carries or pushes it to the next stage in the production line. The delay caused by the need for manual handling can frequently be eliminated by a *complete* conveyor system that reduces manual handling to the absolute minimum. Time is saved, unit costs are reduced, and the profit margin is widened. A trained Cyclone salesman can analyze your present materials-handling system to uncover time-wasting procedures, and suggest improvements. His analysis costs nothing, and his recommendation will be tailored to *your* plant and *your* needs. Just fill in the coupon.

USS and Cyclone are registered trademarks

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Spiral Woven • Flat Wire • Flex-Grid

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Dept. H39, 614 Superior Avenue, N.W.
Cleveland 13, Ohio

Please send me, without obligation, your catalog No. 5 on Cyclone Processing Belts.

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Company.....

Address.....

City..... State.....

For more data, circle 338 on Reader Service Card

Businesspaper advertising brings you information on new and better products, alerts you to new processes and production methods by which you can improve your own products. That's why it pays to read the advertising in your businesspaper. Helps you keep an ear to the ground for new and important developments you can put to work—profitably.

BETTER PRODUCTS
LOWER PRICES
MORE JOBS

Businesspaper advertising helps to lower prices of the products you buy and sell by broadening markets, building sales volume, bringing you cost-saving opportunities. When you're looking for ways to lower costs and prices . . . give better value . . . and improve profits, it's the editorial pages of your businesspapers that tell you *how* —and the advertising pages that tell you *with what*.

Businesspaper advertising helps create demand, improve products, step-up production, distribution and sales. With new companies, new factories, new products, new services constantly being developed, you get a healthy, vigorous economy—a full-employment economy. Yes, sir! Advertising works. And it works for you.

Advertising works for you!

Advertising Federation of America

Advertising Association of the West

Prepared for AFA and AAW by the Associated Business Publications in the interest of better understanding of businesspaper advertising.

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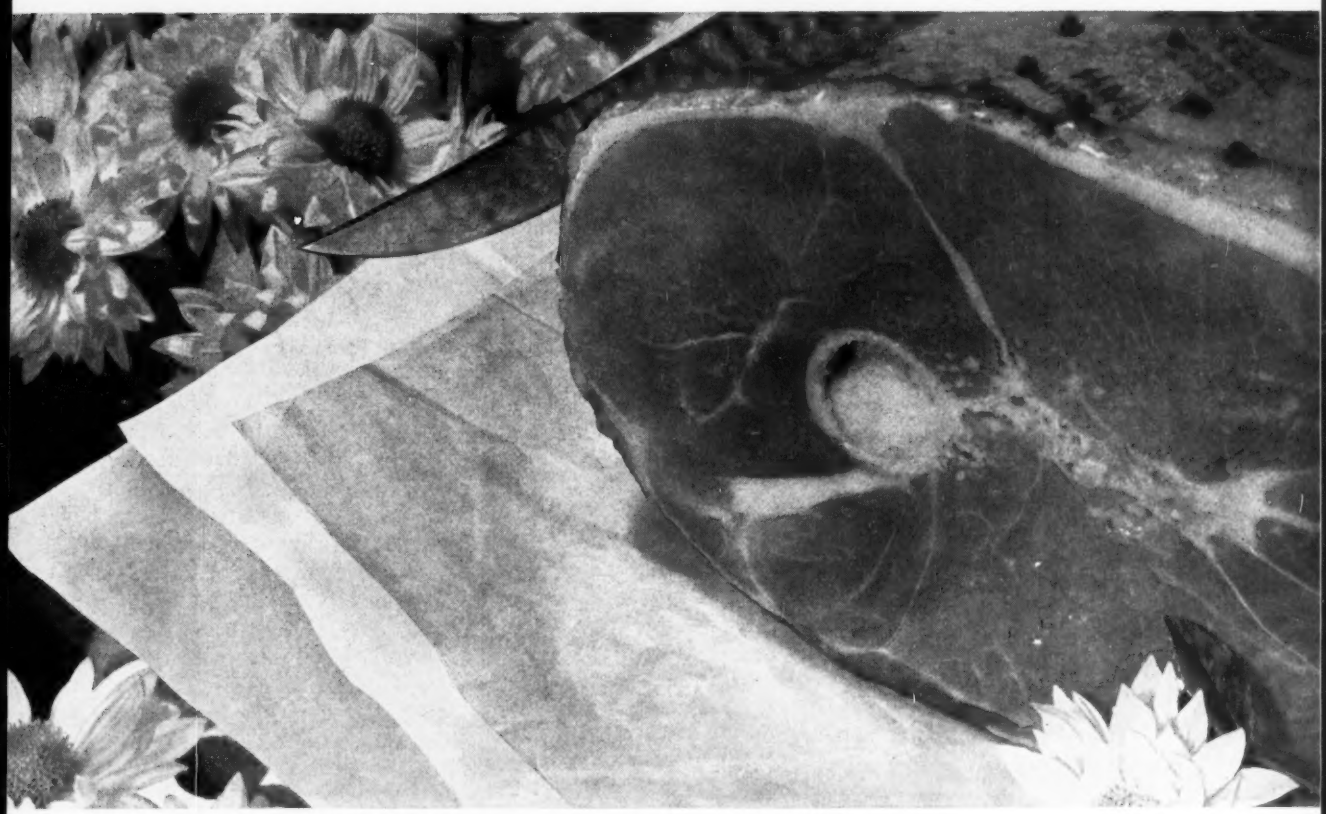
This is the freshness you capture in a Daniels wrap



EVERY BIT OF THE MOUTH-WATERING GOODNESS of this ham was captured and locked in at the moment of peak freshness in a Daniels Wrap of patented Tri-Pak. Patented Tri-Paks were created by Daniels especially for hams and smoked meats.

Tri-Pak is really a three-in-one wrap with an inner sheet of grease-resistant glassine to guard against flavor loss or contamination, a middle sheet of absorbent wet strength paper, and a tough crisp outer wrap with an ideal printing surface, all fastened at one edge for fast, simple operation.

Our artists and craftsmen will give your packaging problem the same meticulous care in design and printing. Contact your nearest Daniels sales office today or write Daniels Manufacturing Company, Rhinelander, Wisconsin.

Sales offices: Rhinelander, Wisconsin . . . Chicago, Illinois . . . Haverford, Pennsylvania . . . Akron, Ohio . . . Omaha, Nebraska . . . Dallas, Texas . . . Los Angeles, California

DANIELS

MANUFACTURING COMPANY
RHINELANDER, WISCONSIN

creators • designers of flexible packaging multicolor printers

MEMBER OF WISCONSIN PAPER GROUP FOR BETTER POOL CAR SERVICE

TORULA
YEAST U.S.P.
adds
high protein
to your
product

nutritional enrichment
at low cost . . .

Protein and vitamin content, taste and purity are all important factors in the nutrition of healthy growing babies. Leading food manufacturers have found that primary grown Lake States Torula Yeast provides this needed enrichment at *low cost.*

Exceeding U.S.P. standards for B complex factors and protein, Torula Yeast can enrich your food or drug product. Write today, stating application, to obtain liberal quantity test samples and complete information.

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W. Glenn Wunderly Company
170 E. California Ave., Pasadena 1, Calif.
Dillons Chemical Company, Ltd.
137 W. Wellington St., Toronto 1, Ont., Can.

RECENT INVENTIONS

PRODUCTS

Coffee Concentrate With Restored, Solvent-Extracted Volatile Flavoring Fractions—Hills Bros., San Francisco. No. 2,853,387.

Emulsifying-Stabilizing Mix for Improving Frozen Confections—N. S. Harrison, Center Point, Tex. No. 2,853,391.

Frozen-Dessert Stabilizer Comprising Alginic Acid Amide—R. Kohler, Dusseldorf, Germany. No. 2,854,340.

Salt Stabilized Against Moisture Agglomeration—F. Waldo, Pittsburgh. No. 2,854,341.

Full-Flavored Dehydrated Juices Concentrated Under Reduced Pressure With Volatile Flavoring Added—USDA. No. 2,854,343.

Fruit Juice Flavoring Particles Stabilized for Package Mixes—Pillsbury Mills, Minneapolis. No. 2,855,315.

Dry Pectin Product That's Quickly Dispersible in Water—Foremost Dairies, San Francisco. No. 2,856,288.

Potato Pancake Comprising Grated Spuds and Farinaceous Material in Heat Gelated, Non-Fried Molded Form—M. M. Scharf, Green Bay, Wis. No. 2,856,295.

PROCESSING

Browning Flour by Applying Heat-Conductive Compressing Surface to ¾-In. Layer—E. A. Fabish, Mc Henry, Illinois. No. 2,848,332.

Candying Fresh Pitted Cherries by Impregnating Under Vacuum With Aqueous Solution of Sugar, Calcium Salt, Sulphur Dioxide—G. A. Fisher, Selinsgrove, Pa. No. 2,848,333.

Coating Dried Egg Albumen with Triethyl Citrate to Curb Dusting—Pillsbury Mills, Inc., Minneapolis. No. 2,850,394.

Deboning Fowl Necks by Inserting Heat-Conductive Support Through Central Opening, Cooking, Pressure-Spraying—M. L. Goldberg, Glencoe, Ill. No. 2,851,362.

Producing Cheese Curd by Tying Up Calcium and Magnesium Ions of Milk, Culturing, Freeing Ions by Acidification, Coagulating, Separating Curd—Swift & Co., Chicago. No. 2,851,363.

EQUIPMENT

Processing Line for Simplifying Sticking-Bleeding of Slaughter Animals—Geo. A. Hormel & Co., Austin, Minn. No. 2,841,817.

Cheese-Storage Device Comprising Vertically Aligned Shells Adapted for Rotation—C. O. G. Persson, Halmstad, Sweden. No. 2,841,870.

Grooved Shredding Roll for Cereal Products—National Biscuit Co., N.Y.C. No. 2,842,071.

Apparatus for Releasing Animal Carcass From Overhead Rail—Armour & Co., Chicago. No. 2,846,721.

Confection Mold Filler Comprising Vertically Reciprocable Mold Elevator, Confection-Dispensing Nozzle, Synchronizing Means—M. B. Rasmussen, Sacramento, Calif. No. 2,850,051.

Dehydrator Consisting of Concentric, Perforated, Horizontally Rotatable Drums; Feed, Discharge, and Rotary Seal Means—F. G. Lamb, Weston, Oregon. No. 2,850,809.

PACKAGING

Flat Top Carton-Infeed Unit for Filling Machine—Ex-Cell-O Corp., Detroit. No. 2,850,900.

Frozen-Food Thaw Indicator Employing Dye-Containing Cord That Changes Color at Predetermined Temperature—J. Fahringer, Phoenixville, Pa. No. 2,852,395.

Packaging Unit for Filling and Closing Bags Having Bag Gripper and Tapered Filling Spout—St. Regis Paper Co., N.Y.C. No. 2,853,842.

Leakproof Package Comprising Flexible Wrapper and Scored Paperboard Blank—American Can Co., N.Y.C. No. 2,854,799.

Want more information on any of these recent patents—if so, you may obtain detailed printed copies by writing direct to the U. S. Patent Office, Washington, D. C., giving serial numbers of those you want and enclosing 25¢ for each copy.

SPROUT-WALDRON

Pointers

for Mixing and Blending • Size Reduction
Size Classification • Bulk Materials Handling • Pelleting and Densifying

Published in the interest of better processing by Sprout, Waldron & Co., Inc., Muncy, Penna.

FLOUR FLOWS LIKE WATER

When the Wonder Bread Division of Continental Baking Company went to pneumatic bulk handling just about a year ago it was the first operation of its kind in the West. Although many similar systems have been put in operation since, the Wonder Bread story is well worth repeating.

Storage capacity, equal to over 10 carloads of flour, is held in three 14′ diameter vertical Permaglas bins. Airslide cars, unloaded by S-W Portaflow Units, blow the flour through 4″ conveying lines right to the top of the 50 foot high bins.

"The flour flows like water" is the most common expression you'll hear around this plant. Although our engineering division tells us that true fluidization in any pneumatic system is only possible for short distances, when you see flour being unloaded and binned at the rate of 1000 lbs/minute, you feel like saying that if this flour isn't flowing like water, it sure is mighty close! Reprints of the article describing the system at Wonder Bread are available on request. Our files contain many case history articles, catalog and technical reports. For prompt analysis of your materials handling problem, contact your Sprout-Waldron representative.

LABORATORY PELLET MILL USED IN RESEARCH

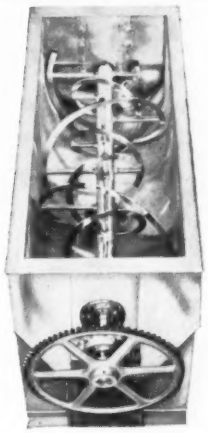
The Sprout-Waldron Laboratory Pellet Mill exactly reproduces the end results to be anticipated from high production pelleting machines. This enables researchers to complete studies on many applications involving pelleting and to project operating methods and costs.

The Sprout-Waldron Laboratory Mill is not a miniature pelleter, hence there are no complicated factors needed for scale up. Production rates are directly proportional to the horsepower utilized. Here is a piece of lab equipment which has every advantage found on production models. A large variety of die sizes is available from stock and the machine can be fed by hand or by any number of mechanical feeding devices. For details, ask for Bulletin 176.

— SW —

THE BIG PLUS

Copies of the S-W condensed catalog (Bulletin No. 178) of equipment and systems for the chemical and processing industries are still available. This two color, 20 page booklet illustrates attrition, hammer, roller and pellet mills; vertical, horizontal and continuous mixers; sifters, crushers, blenders, bucket elevators, conveyors, feeders and the complete line of pneumatic handling equipment, bulk trucks and storage structures.



TROUBLED WITH A "DIRTY" MIXER?

Pigment and dye manufacturers know the danger of color contamination. That's why so many of them specify the Sprout-Waldron mixer with its smooth crevice-free stainless steel interior.

Take a good look at the unretouched interior above. Notice the smooth surface, the large radius welds, the absence of bolts and the many signs of Sprout-Waldron craftsmanship which assure you of a mixer that is easy to clean, and designed to produce perfect batches day in and day out.

This small Laboratory Mixer is suitable for production work. Its features include: variable speed drive, stainless steel construction throughout, jacket for heating or cooling, thermometer well and flush type, liquid-tight plug gate. From the smallest Lab Mixer to the largest conceivable production model, you can rely on Sprout-Waldron know-how to keep your products free from contamination. Ask for Bulletins 194, 128 and 148.

CP/103

For more data, circle 341 on Reader Service Card

INGREDIENTS FOR THE FOOD PROCESSOR

CARROT OIL

makes food

golden yellow

Carrot oil, like butter, contains carotene. Carrot oil is extracted from carrots, and each pound contains up to 25 million units of carotene, the international standard of vitamin A activity. Carrot oil is preferred for vitaminizing foods because it is a natural vegetable oil and because it contributes vitamin A activity of high stability and desirable golden yellow color. Carrot oil is not synthetic, does not contain animal fats of any kind, and does not produce fishy flavor.

SEND FOR BOOKLET

New 36-page combined catalog on carrot oil for foods, feeds, and pharmaceuticals, important reading for most food processors. Write today!

NUTRITIONAL RESEARCH ASSOCIATES
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FOOD DEVELOPMENT LABORATORY

S. W. ARENSON, *Director*

Ingredient evaluation ● New Products development. Specializing in flour shortenings, milk and other basic ingredient ●● Facilities, chemicals and physical laboratory, bakery, spray dryer and other unit process equipment.

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JUdson 6-1748-9

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Consultation on Food Problems
Analyses of Foods and Beverages
Food Plant Design and Process Improvement
Research and Investigations
Legal Testimony

Write for bulletin describing facilities and services
230 Washington St., Mount Vernon, N. Y.

FOSTER D. SNELL

Research Laboratories

SENSORY PANEL TESTS

Food Analysis, Stability Studies, Evaluations, Packaging Problems, Vitamin Assays.

Write For
"Food Facts"

29 W. 15th St., N. Y. 11 — WAtkins 4-8800

STRASBURGER & SIEGEL, INC.

Chemists—Bacteriologists—Food Technologists

Specialists in Canned and Glassed Foods
Laboratory Services

Testing Tomato Products, Mayonnaise, Pickles, Oils, Fats, Beverages, Sugars, Filth in Foods, Food and Drug Libels, Expert Testimony

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Send NEW Ads & Inquiries to Classified Div. of Food Engineering, P. O. Box 12 for April issue closing March 20th

CHEMICAL ENGINEERS

Immediate vacancies for chemical engineers to do process design and development work at the pilot plant level in our food research laboratories in Minneapolis. 22-30 years old, B.S. degree in Chemical Engineering. Experience in food research, food pilot plant or food production desirable. Include complete resume of training and experience in letter.

PERSONNEL, Room F
CENTRAL RESEARCH LABORATORIES
GENERAL MILLS, INC.
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MINNEAPOLIS 13, MINNESOTA

FACILITIES ENGINEER—Degree in Electrical Engineering, plus 3-5 years experience in plant circuitry, motor control and distribution substation activities. To design, establish and otherwise supervise plant installations. Locate at Minneapolis.

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Positions offer excellent growth opportunity in expanding operations. Send complete resumé, including salary requirements to:

Calbert Butler
THE PILLSBURY COMPANY
Minneapolis 2, Minnesota

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POSITIONS VACANT

Project Engineer for Leading Food Equipment Manufacturer. Engineering degree required. Prefer 5 or more years experience in designing food machinery. Ability to expand on basic machinery concepts. Must have imagination. Wonderful opportunity for right man to connect with very fast growing company. Write full details only if qualified to Engineering Dept., Gordon Johnson Co., 2519 Madison Ave., Kansas City, Mo.

Excellent opportunity for qualified man. Well established company located in the East. Must have background in manufacture of quality cottage cheese. College graduate preferred. Write, giving all details regarding experience, personal habits, age, present work and salary. Replies confidential. P-9942, Food Engineering.

Wanted quality minded man with experience in bakery supply manufacturing plant. Must have some experience in the manufacture of Bakers Jams, Jellies. Some knowledge in Bakery Specialty items would be helpful. Well established Concern, located in upstate New York. Write resume of education, experience, age and salary required. P-9988, Food Engineering.

Quality Control Manager. In Chicago general offices under director of quality control and new product development. Requirements: Proven ability to direct men, expert food science background, keen mind, drive for personal development, independent judgment, courageous and articulate. Apply to Topco, 431 South Dearborn, Chicago 5, Illinois. Phone: WAbash 2-5970.

Research & Quality Control Staff Position. Open in Topco's Chicago General offices. Requirements: Academic background in food science and at least one year of food industry experience in quality control. Please send resume. Apply to Director of Quality Control and Product Development, Topco, 431 South Dearborn St., Chicago, Ill. Phone: WAbash 2-5970.

EMPLOYMENT SERVICE

Salaried Personnel $5,000-$30,000. This nationwide service successful since 1927 finds openings in your field. Sells your abilities; arranges contacts. Present position protected. Write for details—Jira Thayer Jennings, P. O. Box 674, Manchester, Vt.

POSITIONS WANTED

Position Wanted—Food Technologist, B.S. degree, 5 yrs. experience food fields, desires position in New England. PW-9945, Food Engineering.

Industrial salesman can offer manufacturer eleven years experience in selling to larger manufacturers and also wholesale industrial supply trade. Have B.S. degree and excellent sales record covering Penna., Maryland and Delaware. Resume upon request. PW-9925, Food Engineering.

Sanitarian, Quality Control: B.S. Agriculture. Three years experience. Want job with a future. Age 25, family. Reply for future qualifications. PW-1076, Food Engineering.

Young, experienced food technology graduate is seeking position of responsibility and opportunity for advancement. Background includes 6 years in diversified food products industry as quality control, processing and packaging supervisor. PW-1081, Food Engineering.

Specialty Food Executive—experience heavy in salad dressings and condiments, plant management, purchasing, cost and quality control, product development. Graduate work in Food Technology. Early thirties. Married. Seeks growth opportunity. PW-1104, Food Engineering.

BUSINESS OPPORTUNITY

For lease or sale. Former ice cream plant on main highway, 7000 sq. ft. on one floor. Built in 1949, Two freezer rooms, 65 tons of refrigeration. Good for food distribution or processing plant. Sweetlands; 2702 Fenton Rd., Flint 7, Michigan.

FREE LITERATURE

Otto W. Cuyler Corporation, Webster, N. Y. has issued a new 1959 catalog of new, used and rebuilt food processing equipment for canners and freezers. Particular emphasis has been placed on several new improved machines as well as a complete resume of the company's extensive operations.

FOR RENT

Space For Rent—6000-8000 sq. ft., refrigerated, suitable storage or packing. New York City, West Side near 14th St. FR-1105, Food Engineering.

WANTED

Anything within reason that is wanted in the field served by Food Engineering can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

FOOD PROCESSING MACHINERY

NEW • USED • REBUILT

Horix 18-valve stainless steel rotary Juice Filler;
FMC Continuous Peelers;
CRCO #4, #5, and #6 Bean Graders;
1,000 #2½ Continental Cans with covers;
Elgin single head screw-type Capper;
Panama Closing Machines, diameter range 208-404, height 300-700;
FMC 6-valve S.S. Juice Filler;
FMC 10-valve S.S. Filler for 46-oz. cans;
Horix Model "O" 6-valve Filler;
FMC #2 and #303 Handpack Fillers

OTTO W. CUYLER CORPORATION
WEBSTER • NEW YORK

Serving the food processing industry since 1912

BARGAINS FOR SALE

The Ruderman Machinery Exchange of Gouverneur, N. Y., one of the largest diversified Machinery & Equipment Dealers in America, can furnish you with practically all your needs in Modern Ice Cream, Milk Plant and Electrical Equipment at but a fraction of the original cost.

WRITE—WIRE—PHONE FOR YOUR NEEDS

RUDERMAN MACHINERY EXCHANGE
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MARCH SPECIALS

Elgin 2 Spout S/S Piston Filler.
M&S 6 Pocket Filler for No. 3, Serial No. 34-965.
FMC 6 valve S/S Can Filler good for gals.
Kiefer Rotary 24 spt. 316 SS Vac. Filler.
World Twin Turret Labeler C10006, 120 PM
Standard Knapp Can Labelers, all sizes.
Resina Auto. Capper Model S, Serial 705.
Langsenkamp super Finisher or Pulper.
Diana Dicer No. 9 for meats & veg'ts, 3 H.P. Mtr.

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KNAPP HI-SPEED LABELER

Model D quick adjustable 8 ounce through #10.

New price..$2450.00
Our Price..$1350.00

ME MACHINERY AND EQUIPMENT CO.
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Modern Packaging Equipment

SPECIAL OFFERINGS
PNEUMATIC SCALE COMPANY High Speed fully automatic Cartoning Line.
PNEUMATIC SCALE COMPANY Medium Speed fully automatic Cartoning Line.
Both Lines in 11,000 Series.

KARL KIEFER 24 Spout Stainless Steel Rotary Vacuum Filler synchronized to Karl Kiefer Bottoms-up Rotary Bottle Cleaner with Wormfeed.

BATTLE CREEK, Model #46, Wrapping Machine equipped with Oliver heat seal label attachment.

PACKAGE MACHINERY CO. Model FF Wrappers with electric eye. Practically new.

STOKES & SMITH Model D Neverstop.

FERGUSON fully automatic Cartoning Line.

STANDARD KNAPP & PACKOMATIC Top & Bottom case sealers.

PNEUMATIC SCALE COMPANY Double Package maker and ROTARY Top Closures.

PNEUMATIC SCALE COMPANY High Speed Bottling Line, consisting of: Bottle Cleaner, 20 Spout Vacuum Filler, 4 head Capper and Duplex Labeler, 12,000 series. May be purchased as a complete line or individually.

STOKESWRAP and TRANSWRAP, Models A and B.

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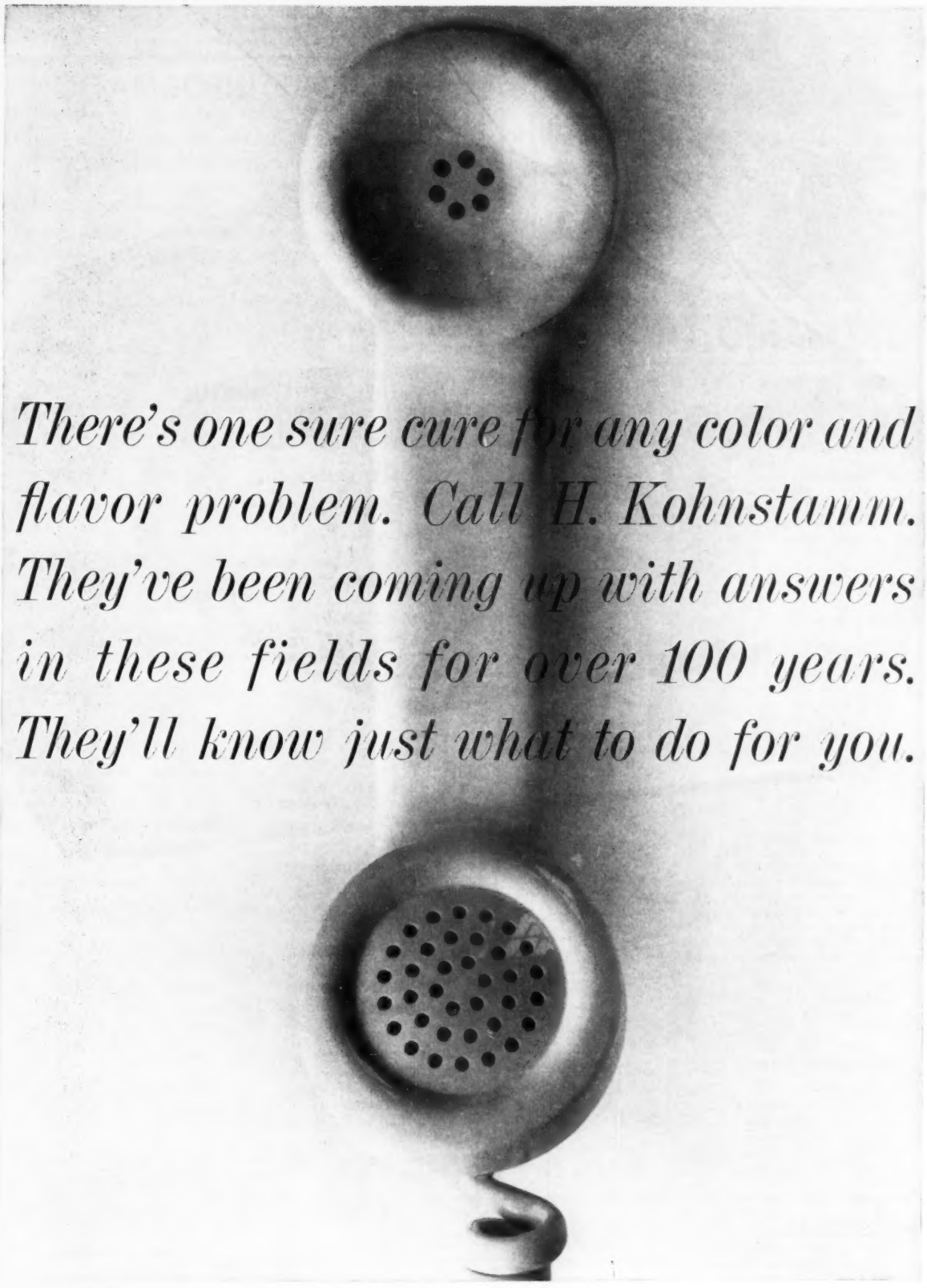
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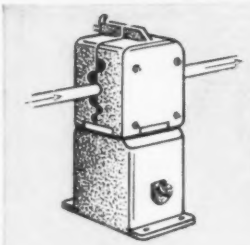

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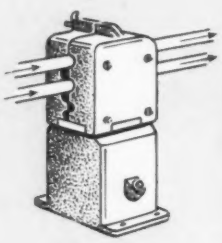

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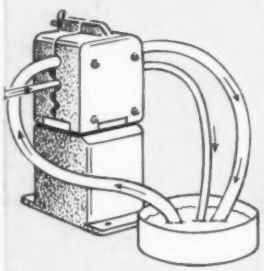

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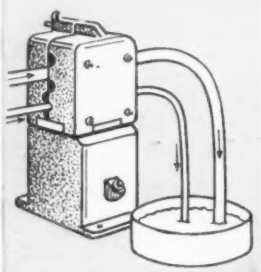

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